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FROM THE BACK OF THE BUSHHOUSE

by Kingsley Dixon

This issue takes us to Western Australia where Dr. Kingsley Dixon, Research Botanist, Kings Park and Botanic Garden tells us of some of the happenings there — Editors

Terrestrial Orchid Culture in Kings Park and Botanic Garden

Three years ago the Kings Park Board which administers Kings Park and Botanic Garden initiated a programme for the systematic *ex situ* preservation of the 150 species of Western Australian orchids. This study included the south-west terrestrial species but was later expanded to include the arid tropical Kimberley region which has a number of terrestrial and epiphytic species *(Dendrobium dicuphum, D. sp* and *Cymbidium canaliculatum)*.

Early attempts to culture W A orchids in Kings Park and Botanic Garden relied upon pot culture of rescued wild material for display or research purposes with some subsequent propagation by self-sowing or division. Initial studies of sterile sowing techniques on nutrient agar met with limited success. However with the new programme in place symbiotic germination was the preferred option following the outstanding success of the symbiotic programme with terrestrial orchids started in the Canberra Botanic Garden. Our symbiotic programme has progressed steadily over the last three years. Currently we are investigating the most satisfactory methods for deflasking and subsequent growth of seedlings exflask. The methods of symbiotic germination and deflasking of terrestrial orchids have been previously reported and updates will be published from time to time.

The purpose of this article is to concentrate on some practical methods of terrestrial orchid pot culture in use in Kings Park. At present some 150 pot growing adult flowering terrestrial orchids are in the nursery and research section representing almost 50 of the 150 species of terrestrial orchids known. *Caladenia, Diuris, Thelymitra* and *Pterostylis* account for 40 species with *Prasophyllum, Lyperanthus, Eriochilus* and other minor genera including Kimberley *Habenaria* and *Calochilus species* accounting for the balance. Three growing areas are utilised — greenhouse (for research), 70% shadecloth covered shadehouse (for research and display) and open frames (for display only). The greenhouse which is cooled in summer is also used for promoting early flowering which in *Caladenia* and *Thelymitra* can be as much as 4-6 weeks earlier than shadehouse grown plants. All terrestrial species are maintained in a dry state during dormancy, with watering commencing in late March for south west species. Kimberley species are moistened in mid spring. Open frame grown plants are maintained in a sawdust 'plunge' over summer — the 2 — 3cm covering being scraped from the top of the pots once watering has commenced or with the onset of cooler conditions in late autumn. Problems have been encountered where premature breaks to the season have resulted in highly etiolated shoots emerging through the protective sawdust canopy. This can be deleterious for *Caladenia* where the major nutrient absorptive structure is at, or just below, soil surface. Eventual removal of the sawdust covering leaves this collar region fully exposed. Nonetheless, 'plunge' pots for growing terrestrials seems to be of some advantage especially for self-sowing seed. The sawdust covering (in our case jarrah hardwood) composts at soil level around the plants and acts as an excellent mulched seed bed for seed sowing.

Greenhouse and shadehouse plants are grown on raised benches and do not have protective covering materials during the dormancy period. With the added protection of the greenhouse and shadehouse, plants grown under these conditions perform similarly to the 'plunge-grown' plants.

Potting and Mixes

Potting is done annually for most species though *Caladenia* especially from the open frames, are only repotted when overgrown (sometimes 3-4 years). Small amounts of parent soil are incorporated into all repotting mixes. Generally mixes are standardised for the four major genera grown and consist of 1 part coarse sand: 1 part fine sand: 1 part composted hardwood sawdust: 1 part composted and well mulched leaf litter (*Allocasuarina* is good). The components of this mix can be varied (as we tend to do each year aiming for the perfect mix - if ever there can be one), or for altering the water holding qualities of the soil mix. However it must be stressed that mixes should be devised to suit local environments and growing conditions. Ultimately though it is important to remember that a healthy orchid is merely a reflection of a contented fungal associate. The organic material in the soil mix is digested by the cohabiting fungus the products of the digestion being passed to the orchid plant. The ratio of organic matter to inert materials (i.e. sand) in the soil mix will influence not only the abundance of other, non-symbiotic fungi, but also the competitive ability of the beneficial cohabiting fungus. The result of this competition may or may not favour the orchid symbiont and therefore lead to the growth or decline of your orchid. A big problem is that the effect of a poorly developed fungal symbiosis may take 2-3 years for symptom expression (and ultimately death of the plant) as the orchid slowly consumes tuber reserves. Thus by the time a grower detects a growth decline some genera (i.e. *Drakaea*) may be too far gone for remedial action. Arriving at the right nutrient balance in a soil mix therefore depends on local growing knowledge. Science is some way off from clearly showing which soil conditions favour a fungus and its symbiosis with a particular orchid species. Interestingly the easiest genus of W A orchids to grow, members of the genus *Pterostylis,* share one of the most vigorous orchid fungal partners.

A practice of many WA orchid growers is to mulch the top 2-4 mm of their pots with coarsely chopped *Allocasuarina* needles. This mulch certainly enhances growth in some genera particularly the growth of *Caladenia* (which also has soil surface mycorrhization).

Some Success Stories

A number of species have responded well to our cultural methods:

***Diuris longifolia* 'Pansy' form.**

This is a large, round flowered form originally collected in Kings Park. Grows well using the plunge-pot method often producing daughter plants out of the drainage holes in the bottom of the pot. A purple form of *Diuris longifolia* from the south coast is particularly appealing and will grow under similar conditions.

Caladenia huegelii

Again from Kings Park bushland this species adapts readily to plunge or shadehouse cultivation. Highly variable in colour from deep rusty red to light green with varying amounts of red spotting. A vigorous species with up to four flowers per stem. Using the plunge pot method self-sowing can yield several dozen plants annually.

Thelymitra macmillanii

This species was wild collected for the purposes of seed production for the laboratory programme. The original shadehouse grown plants have trebled in number by vegetative means producing up to six flowers per stem.

Space does not permit descriptions of all species grown in Kings Park. However with the continued support of the Kings Park Board and the WA Native Orchid Study and Conservation Group the list of cultivatable WA orchids will continue to grow.

Book Review

Corybas West of Wallace's Line by J. Dransfield, J.B. Comber and G. Smith a Synopsis of *Corybas* in West Malesia and Asia.

The genus *Corybas* comprises about 100 species, and this work discusses the 33 species recorded from mainland Asia and western Malesia (Malaya, Sumatra, Java, Borneo and the Philippines).

Although none of the Australian species are discussed, there are many species that have close affinities to our members of the genus. Any lover of terrestrial orchids will need to have this book to increase their knowledge.
The descriptions of each of the newly described species are complete and would be essential knowledge for the serious student of the genus *Corybas*. There are fifteen beautiful botanical drawings and 31 colour photographs represented.

Reprinted from Kew Bulletin, 1986. 52 pages, 154 mm x 245 mm, paperbound. Available from The Orangery Bookshop, Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB. U.K. 5 pounds plus 15% extra for postage & packing, or -
Twin Oaks Books, 4343 Causeway Dr., Lowell, Michigan. 49331. U.S.A. US$9.50 inc. postage.

Rare and Endangered Native Orchid Species Survey

The questionnaire sheet has been completed by Mr. Stewart Penman of Kyogle, Mr. Eric Rankin from Casino and Mr. John Moye from Ballina. Stewart has been a longtime resident of the Kyogle area and spent his childhood in the Upper Tweed district. He is at present engaged in a number of hybridising programmes at his nursery. Eric is a Forestry Officer stationed at Casino, and through this position has become aware of the distribution and abundance or scarcity of a large number of species. John has been a longtime resident in the Ballina area.

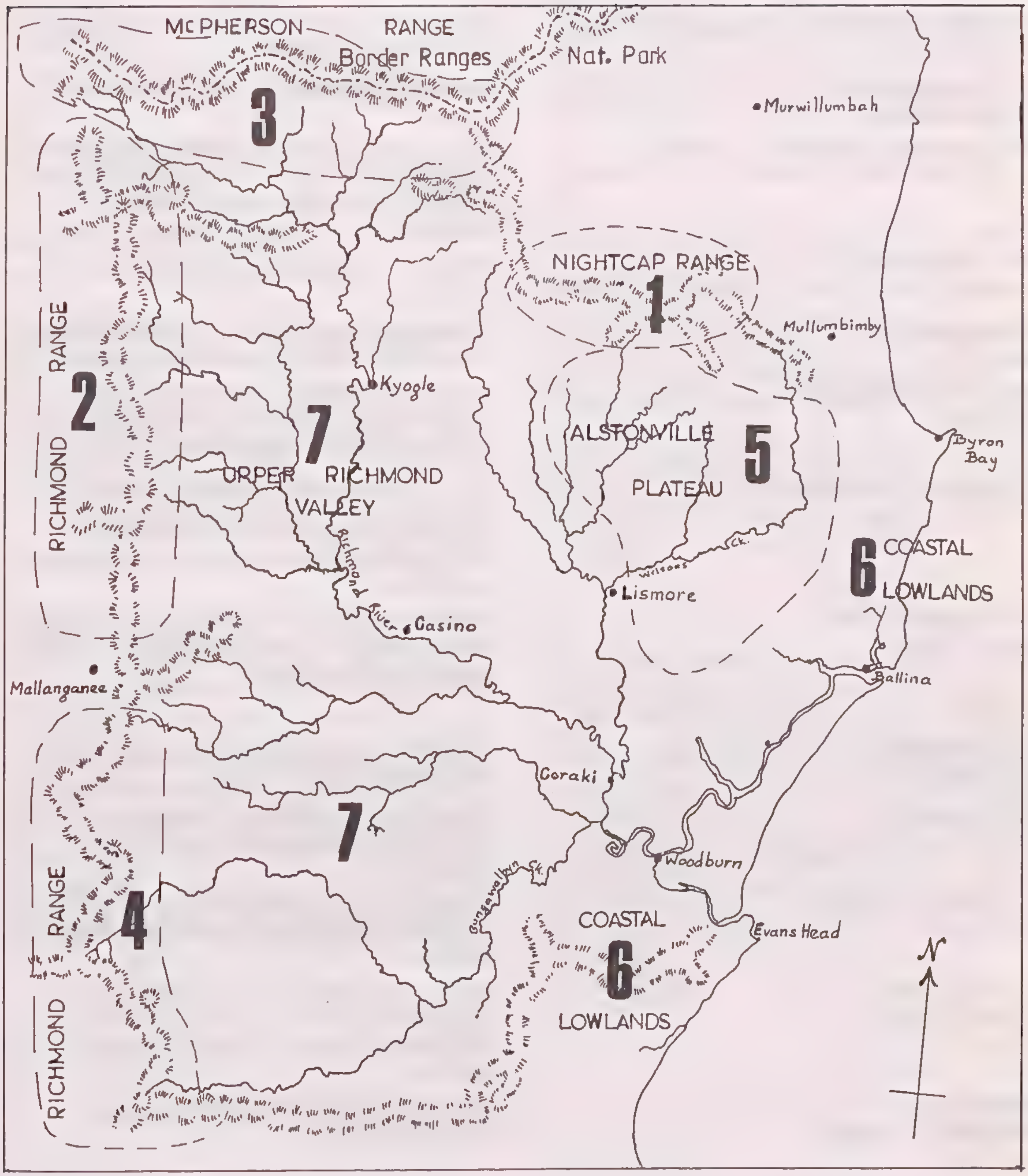
The area selected was restricted to the drainage basin of the Richmond River on the far north coast. This area was considered to include all parts of the interfluves from which the tributary streams derived. For example, Area 2 includes the northern area of the elevated region known as the Richmond Range irrespective of whether streams originating there flowed into the Richmond or Clarence drainage systems. Although areas outside of this drainage area could also have been considered, e.g. the Upper Tweed areas, it was considered that this would only complicate the preparation of the survey material.

It was agreed at the outset that all of the more commercially disposable orchids are susceptible to gathering by a variety of commercial pickers, and most orchids by plant enthusiasts, at some time or other. However, we considered that sufficient restraints were being imposed which would act as a deterrent to both commercial and amateur collecting on any large scale within designated areas. Also, that some areas would suffer little from logging or land clearing/draining projects in the future. The restraints and the environmental protection derives from the gazetting of large areas as National Parks, Flora and Nature Reserves, etc., and the survelliance of these areas by National Parks Ranger, Forestry Officers and local government rangers. Thus, throughout the survey, the statements on "Vulnerability" especially "survival assured," or "habitat protected" or similar are meant to convey this implication.

The areas referred to, i.e. Areas 1-7, are indicated on the attached map.

NAME OF ORCHID SPECIES	**DEGREE OF RARITY ON 1 — 5 SCALE***	
DENDROBIUM		
D. aemulum — found in all areas	4	Host trees valuable for timber resource — some exploitation, regions 1, 4, 6, 7; environmental change, 5, 6, 7. Species not endangered.
D. beckleri — all areas, less common in 6	4 Most common in 1, 2 and 3	Species not endangered — especially areas 1, 2 and 3. Some environmental damage in other areas could restrict range.
D. cucumerinum — restricted to areas 2, 4, 7	4	Largely restricted to inland valleys — hosts normally not removed — hence survival assured.
D. x delicatum	1 in all parts of area	Largely lithophytic, limited suitable rocky formations throughout where both parents occur together naturally. Collecting could eliminate species from area altogether.
D. falcorostrum, only in 3	1	Host trees not numerous, many dying due to opening up of area, roads and increased exposure. Collection could hasten demise.
D. x gracillimum, only in 2 and 3	1	Although a rare plant, habitat protection assured. Collecting could endanger species.

D. gracilicaule — all areas	4	Development could further restrict species in 5, 6, 7. Survival assured in other areas.
D. kingianum — all areas	4	Development could further restrict species in 5, 6, 7. Although commonly sold through chain store outlets in area, species not yet endangered.
D. linguiforme — all areas	4	Although a common orchid, rare in 5 and subject to increasing pressure in 6 due to drainage and clearing.
D. mortii — mainly 1, 4, 5 and 6	4 where found to occur	A more coastal orchid in distribution, therefore subject to increasing pressure, collecting, environmental damage.
D. monophyllum — all areas	uncommon in 4, 5 and 6, but common in 2 and 3.	Habitat destruction areas 5, 6 reduce frequency.
D. pugioniforme — areas 1, 2 and 3	4 above 1000 m	Quite common throughout range — not usually exploited, survival assured.
D. schneiderae — areas 2 and 3	2	Uncommon throughout range, but may be common in restricted areas — not usually exploited — habitat protected.
D. speciosum, var. ***hillii*** — areas 1, 2, 3, 4, 7. 5	3 1	Subject to exploitation, especially on private property, habitat protection and epiphytic nature (sometimes) assures survival in most areas.
D. tenuissimum — areas 1, 2 and 3 4	2 1	Not a common orchid — exploited only by specialist pickers — habitat protection assures survival.
D. tetragonum — areas 1, 2, 3, 4, 7 5 and 6	4 1	Easily collected in some areas, becoming rare in more settled areas — habitat destruction, but survival assured elsewhere.
D. teretifolium — all areas but different forms	4	Widely distributed, but subject to increasing pressure in lowland areas — land clearance, drainage — where species is less common. Needs protection here.
Peristeranthus hillii — only in 6	1 and 4	Frequency related to land development — some habitat protection ensures survival in such.
Papillilabium beckleri — areas 2, 3, 4	2	Not a common orchid, therefore subject to some pressure by pickers if located.
Cymbidium suave — all areas	4	Some habitat destruction — agriculture and forestry (removal of old trees) but seems to be able to survive in most areas.
C. madidum — all areas	3	More demanding in habitat than *C. suave* — development in some areas adversely affecting species, increased by pickers.
C. canaliculatum — noted only in 2	1	Although sometimes encountered, not usually found in coastal areas therefore not subject to any pressures.
Plectorrhiza tridentata — all areas	3	Frequency in some areas related to land usage — survival ensured in protected sites.


McPHERSON RANGE
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Nat. Park
3
Murwillumbah
NIGHTCAP RANGE
1
Mullumbimby
RICHMOND RANGE
2
Kyogle
7
ALSTONVILLE
PLATEAU
5
UPPER RICHMOND VALLEY
Byron Bay
6
COASTAL
LOWLANDS
Richmond River
Wilsons Ck.
Lismore
Casino
Ballina
Mallanganee
Coraki
7
Woodburn
Bungawalbyn Ck.
RICHMOND RANGE
4
COASTAL
6
LOWLANDS
Evans Head
N

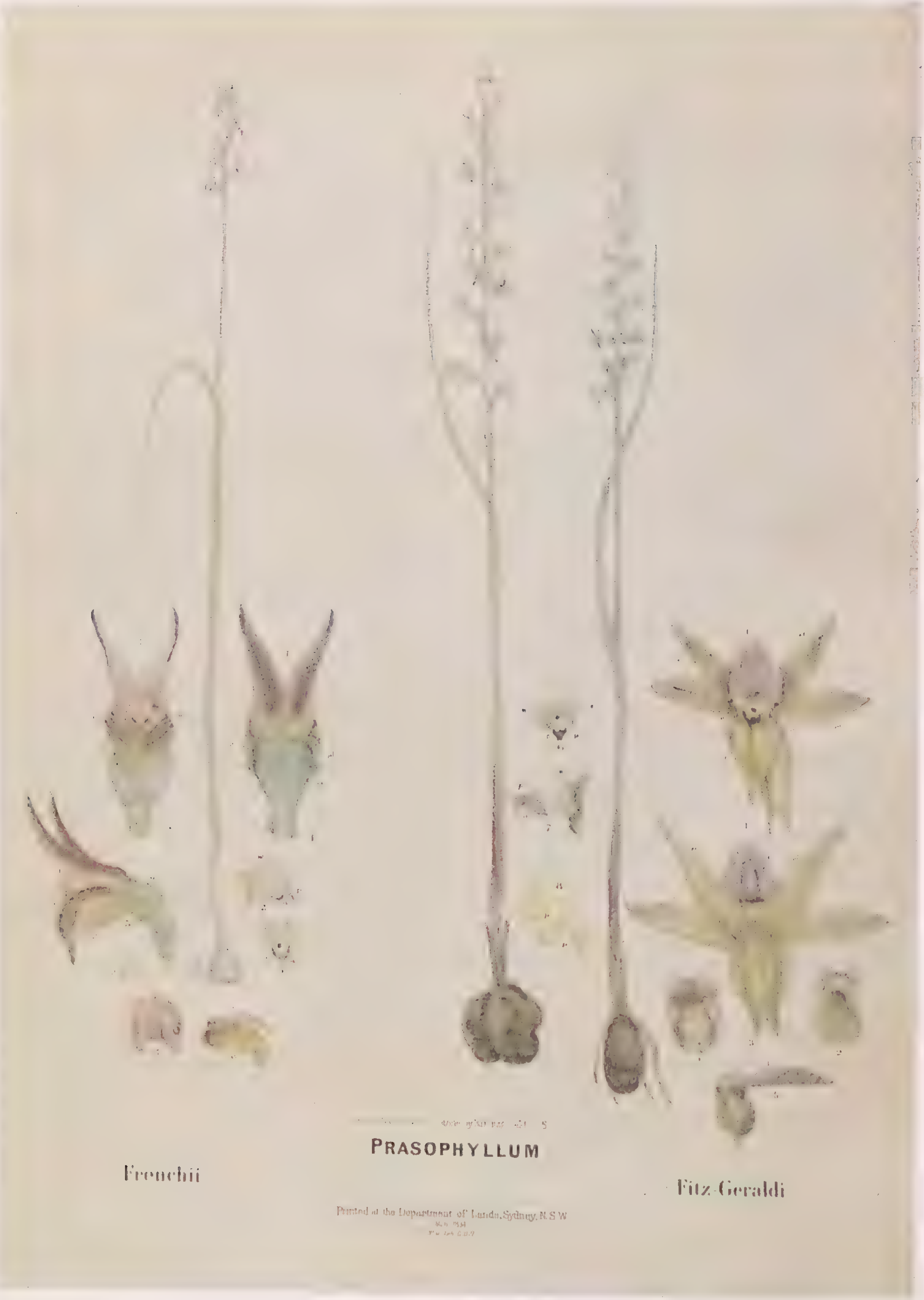
Bulbophyllum aurantiacum — areas 1, 2, 3, 4 6	3 1	Although fairly common, species subject to pressures from commercial pickers — some habitat protection assures survival.
B. bracteatum	as for *D. schneiderae*	
B. elisae — areas 2, 3 and 4	2	May be fairly common in higher altitudes — some habit protection.
B. crassulifolium — all areas except 6	4	Not widely exploited — habitat protected.
B. weinthalii — areas 1 and 3 only	1	Distribution closely related to host trees in areas found — some habitat protection afforded, but sought after by collectors, pickers.
B. minutissimum — reported from 6	1	Not seen — presumed no longer exists in area.
B. globuliforme — area 3	1	Not usually encountered — similar habitat to *B. weinthalii*. Minute size restricts collection.
Sarcochilus falcatus — all areas	3	Although frequently encountered — much sought after by collectors, pickers; pressure increasing in more accessible areas.
S. weinthalii — areas 2 and 3	2	Much sought after by collectors, pickers (especially from southern regions) — increasing pressure in area 2 where it is endangered in some localities; some habitat protection.
S. olivaceus — all areas 5 and 6	3 1	Habitat disturbance in eastern areas, together with collecting — reduced frequency; survival assured in other areas.
S. hillii	as for *S. olivaceus*	
S. spathulatus ***S. dilatatus***	1	Isolated specimens known to exist in one or two areas only.
S. fitzgeraldii — northern parts of 1 only	2	Where known to be found, environment protected — some pressure from illegal collections.
S. ceciliae — areas 2, 3 and 4	3	In known areas, a fairly common plant. Subject to increasing collection by collectors, pickers.
S. hartmannii — areas 1, 2,and 3.	1 or 2	Much sought after plant in specific localities especially by southern pickers, collector. Inaccessible terrain, in part, may assist survival.
Rhinerrhiza divitiflora — areas 1, 2, 3, 4 5	3 2	Survival assured in most areas through habitat protection.
Liparis coelogynoides — areas 1, 2, 3 and 4	3	as above.

L. reflexa — areas 1, 2, 3, 4, 7	4	Survival assured in most areas through habitat protection, inaccesible terrain and general lack of appeal — however of increasing appearance in retail chain stores.
Galeola cassythoides — areas 2 and 4	2 — 3	Both species may be frequently encountered in specific locations. Whilst some disturbance of environment may assist growth of plant in short term, long term future threatened in more favourable land development near coast.
G. foliata — areas 5 and 6		
Oberonia palmicola areas 1, 5 and 6	2	Although colonies may be encountered, distribution now restricted to least disturbed areas.
Geodorum pictum	1	Although known to exist previously in coastal areas, now possibly extinct in area — land clearing and drainage schemes.
Calanthe triplicata — all areas	3	May be common in specific areas and although found in a wide range of habitats, colonies in coastal areas now very restricted — land clearing, settlement, collection.
Phaius australis ***P. tankervilliae*** — area 6	1	Both species now quite rare and must be regarded as endangered. Pressure on habitats land reclamation, clearing, settlement and collection. Some habitat protection for isolated colonies, but not from illegal collection.

Other terrestrial Orchids

Many genera of terrestrial orchids occur throughout the area, and some genera are represented by many species. Some species are able to adapt to changing environmental conditions remarkably, e.g. *Spiranthes sinensis, Microtis unifolia* have been observed to survive being frequently mown! Land clearing for commercial agriculture, drainage schemes, urban development, grazing by exotic animals, increasing use of weedicides threaten some species throughout the entire region. However, it is considered that sufficiently large areas, presently under the control of the Forestry Commission, The National Parks and Wildlife Authority, or Flora Reserves, will afford protection to most species, and constitute areas from which individual species may migrate under more favourable conditions.

Although some collecting of the smaller terrestrials occurs, there does not appear to be the same interest in these plants by commercial enterprises, as does occur with many of the epiphytic and lithophytic orchids.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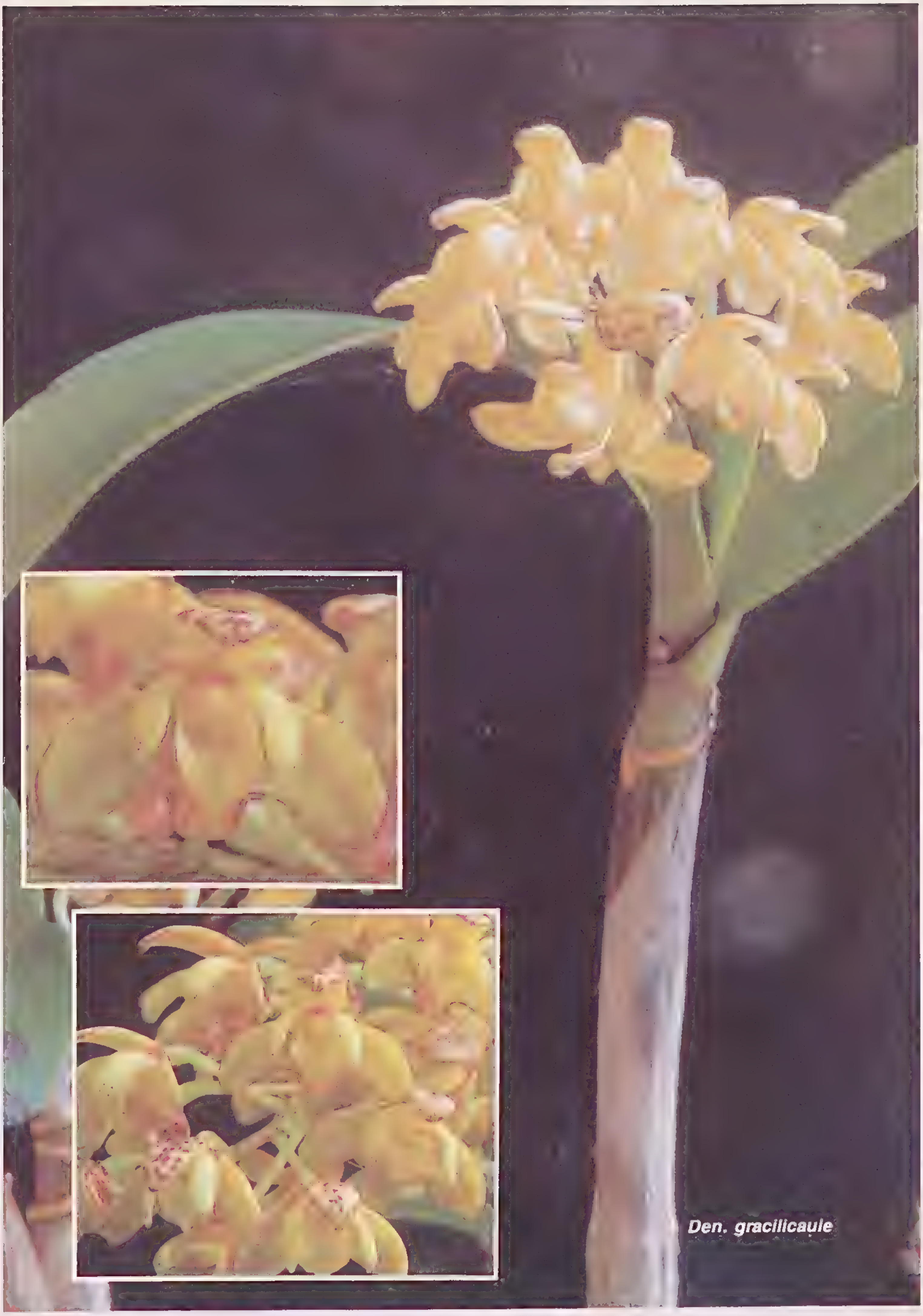


Den. gracilicaule

Orchid Hunting in Farthest England

Ian St. George

Legislation to protect Britain's endangered plants came with the Wildlife and Countryside Conservation Act of 1981. Thus a penalty of 1000 pounds for each plant may be imposed if you intentionally

- pick, uproot, destroy or sell any of the 62 very rare plants under special legal protection
- collect or sell their seed
- dig up any wild plant without the permission of the owner or occupier of the land
- plant or otherwise cause to grow in the wild some species not native to the country.

Now further protective legislation is being considered by the British Parliament, but there are problems.

While environmental groups are pressing for *compulsion*, the government appears to be committed simply to *persuasion*. Landowners are asked to accept compensation for not developing key sites: In effect they are paid to do nothing — all they have to do to get money is to threaten to destroy a site, according to a 1986 report.

Many people were enraged in 1985 when in Scotland a botanically sensitive area of farmland was bought by a City syndicate. The land was quite unsuitable for forestry, but the company immediately announced its intention to plant pine trees, and as quickly applied for compensation not to do so. The question becomes one of political philosophy: may a landowner do as he wishes on his property, or should he regard himself rather as its custodian, on behalf of all of the people, for the time of his tenancy?

Meantime Nature Conservancy Trusts are active. David Lang, a Lewes, Sussex veterinary surgeon and author of the book *Orchids of Britain* says that vets are well placed to spot threatened plants on farmland. Then the best approach is to get on side with the farmer, help him develop a sense of pride that he possesses something rare and beautiful, reassure him that its preservation will not cost him anything, and then, if it is possible, persuade him to share or hand over management of a sensitive area to the Trust. The Trust will advise about the right amount of grazing, pest control, fertilisers, weeding, drainage and so on, to encourage the plants. David Lang manages a site surrounding an old chalk pit where several orchids grow, and leads a management team that he has handpicked for their expertise in a variety of relevant disciplines.

He is typical of a cadre of quietly determined people whose anxiety about the destruction of wild plants (and animals) has led to change. Their character is neither that of the stereotyped British naturalist (eccentric, flighty, impractical), nor that of the stereotyped protester (young, loud, angry): these people are knowledgeable, articulate, and reasonable. They are also quietly insistent enough for the logic of their cause to persuade others that saving rare plants makes good sense. The growing interest in rare plants has itself been a mixed blessing though. Too many visitors can wreck a habitat; they trample young plants, or simply compact the soil so that seedlings will not thrive. Some places are therefore kept secret. If you ask to be allowed to visit the English Lady's Slipper you will not be refused: the local Nature Conservancy Council will simply deny all knowledge of the site. When I phoned to ask for the exact location of the Military orchid, my contact had already left for the site, and nobody else could, or would, tell me where it was — fortunately my map reference was enough. When we joined a party to visit the Late spider, there were just too many of us — the vegetation around the three flowering specimens was flattened.

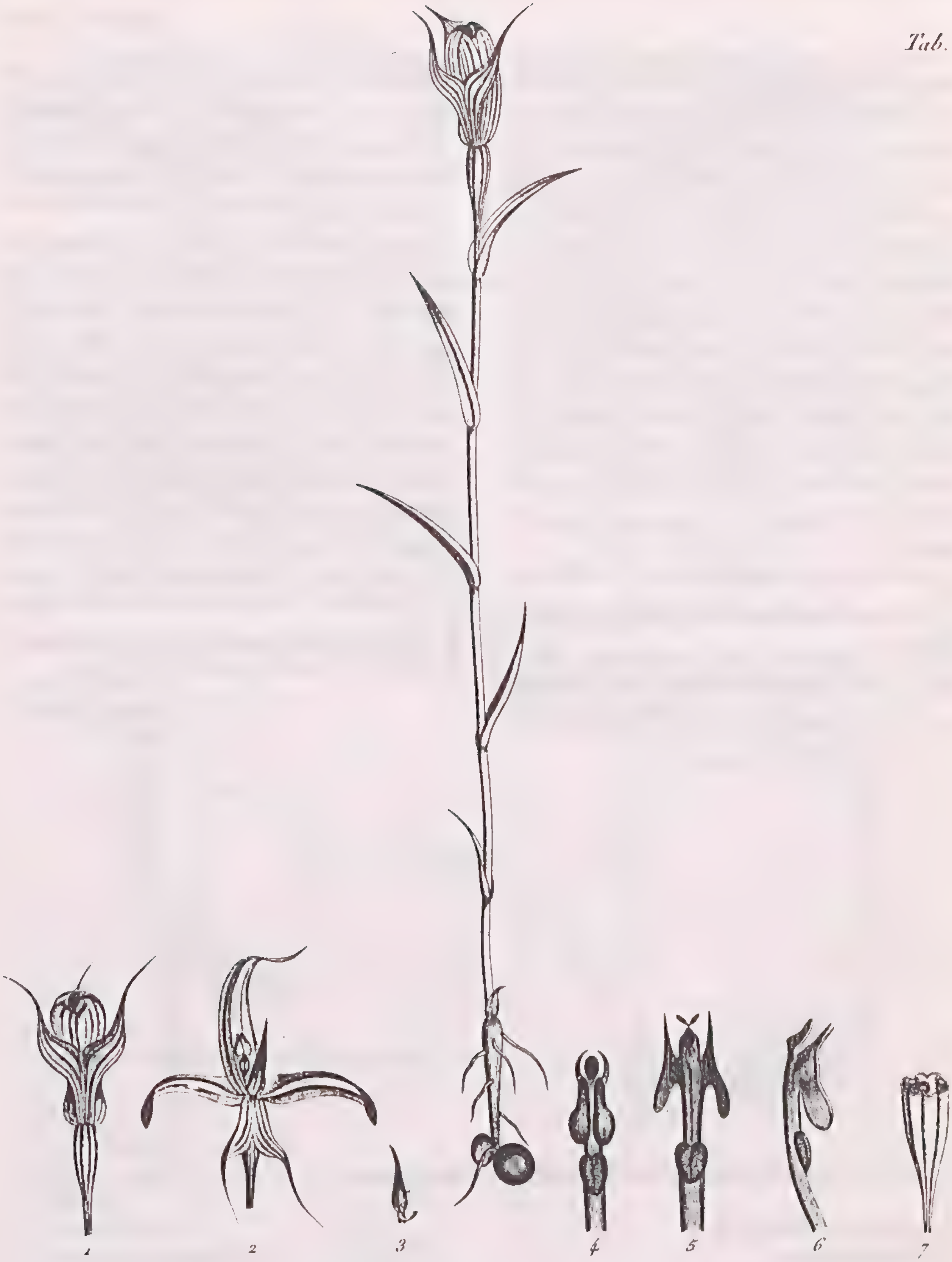
Continued p.18.

Pterostylis alata (Labill.) H.G. Reichb.

In the September 1986 issue of The Ochadian an article on the genus *Pterostylis* by Leo Cady mentioned that the first printed recording of *Pterostylis* was in 1806, as *Disperis alata*, by the French botanist Labillardiere in Novae Hollandiae Plantarum Specimen. The drawing that accompanied the description has been borrowed from Leo and is printed herein. This species was placed in *Pterostylis* by H.G. Reichenbach in 1871 as *P. alata*.

Key to drawing:
1. Flower
2. Expanded view of flower
3. Labellum
4. Column front view
5. Expanded view of column
6. Column side view
7. Capsule, showing a cross section

Tab. 210.



Poiteau Del. DISPERIS alata. *V. Plée Filius Sculp.*

Dendrobium macropus subsp. *gracilicaule* (F. Muell.) P.S. Green

by Walter T. Upton

How sad it is that our *Dendrobium gracilicaule* has received a legitimate name change and it is now *Dendrobium macropus* subsp. *gracilicaule*. At the Leningrad International Botanical Congress in 1975, article 71 of the International Code of Botanical Nomenclature was deleted. This article stated "A name must be rejected if it is based on a monstrosity". With article 71 removed the way was clear for the name *Dendrobium macropus* to be accepted as legitimate, and as it is an earlier name than *D. gracilicaule* it must take priority over that name.

D. macropus is a species of two different forms from Norfolk Island and the abnormality that made its name illegitimate previously is that the flowers are peloric and they are self pollinating.

The name changes have been carried out by P.S. Green, Honorary Research Associate, Royal Botanical Gardens, Kew, in the Journal of the Arnold Arboretum, Vol. 67: 115 (1986), the new names are —

D. macropus subsp. *macropus* from Norfolk Island.

D. macropus subsp. *gracilicaule* from N.S.W. and Qld.

D. macropus subsp. *howeanum* from Lord Howe Island.

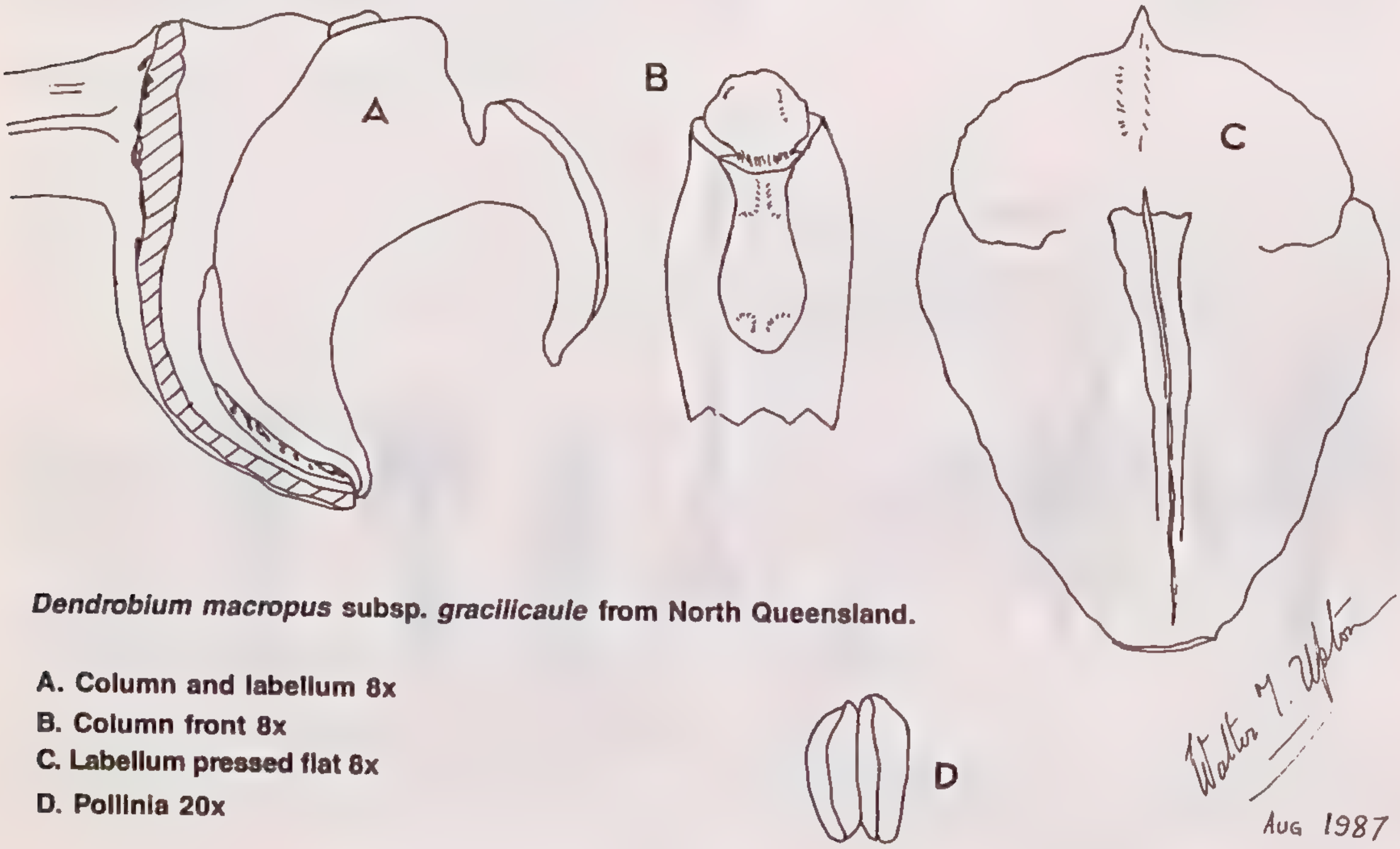
Under *D. macropus* subsp. *howeanum*, Green states "This subspecies passes under a number of names on several southwestern Pacific Islands. For example, it also occurs on New Caledonia (under *D. gracilicaule* F. Mueller; see Halle 1977) and Fiji (as *D. gracilicaule* var *vitiense* Rolfe). It is conspecific with but sufficiently distinct — by virtue of its shorter, stouter inflorescences and its unspotted flowers (rarely with a few marks) — from subsp. *gracilicaule* on the mainland of Australia, which we believe to be closely related."

This year I flowered my plant of *D. macropus* from Fiji and the flowers were almost identical with our own *D. macropus* subsp. *gracilicaule* as can be seen from the photos and drawings. The flowers are quite heavily marked on the rear of the segments, and are not unspotted as quoted above. The column appeared to be smaller and the stigmatic cavity was a slightly different shape from the numerous Australian members I checked it with. The flower pedicel was a lighter colour. The four racemes carried 8, 10, 20 and 26 flowers. The main difference was in its shorter stumpier pseudobulbous stems and the leaves were also shorter and wider. The whole plant has a neater and more compact appearance.

The plant drawn was obtained from a native orchid grower in Fiji by Ross Sadlier during a visit to Fiji.

In Norfolk Island there are two quite distinct forms and they both have peloric flowers.

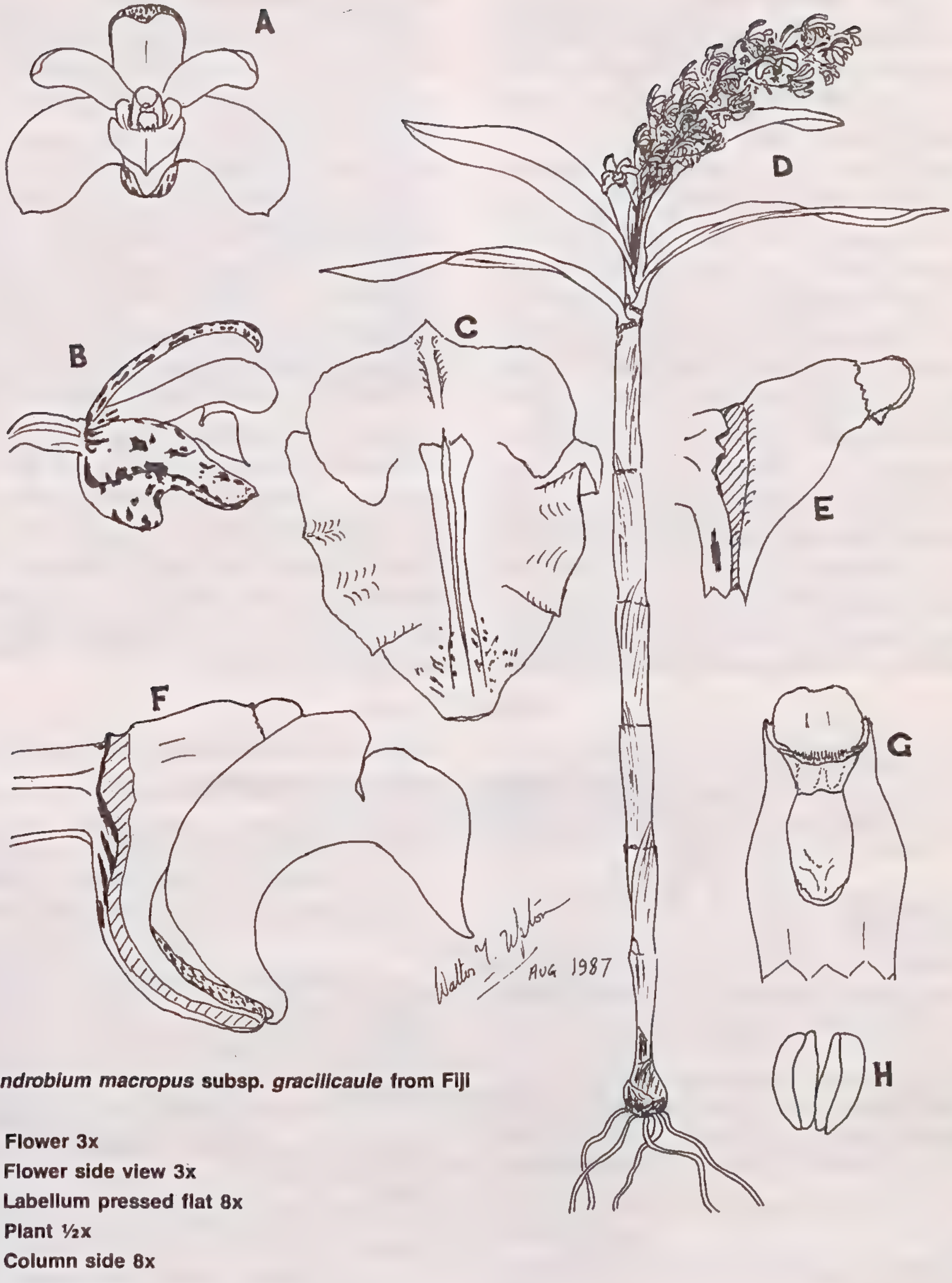
71 Wesley Street.
Elanora Heights,
N.S.W. 2101



Dendrobium macropus subsp. *gracilicaule* from North Queensland.

A. Column and labellum 8x
B. Column front 8x
C. Labellum pressed flat 8x
D. Pollinia 20x

Walter T. Upton
Aug 1987



Dendrobium macropus subsp. *gracilicaule* from Fiji

A. Flower 3x
B. Flower side view 3x
C. Labellum pressed flat 8x
D. Plant ½x
E. Column side 8x
F. Column and labellum side 8x
G. Column front 8x
H. Pollinia 20x

Editorial

by Walter T. Upton

The last issue of Volume eight has been completed by our retiring Editor Michael Penberthy. Despite the many problems encountered, he has continued to produce The Orchadian; he has given much time to our Society carrying out a very difficult task. We thank him profusely for it.

Goodbye Volume Eight. Welcome Volume Nine! With the retirement of Editor Michael Penberthy, it has fallen to the lot of Murray Corrigan and I to put together the first issue of Volume Nine, assisted by Michael Harrison and Philip Spence. We hope the new format will be acceptable to our members, be assured it has been given much thought. The future also appears as a bright light in the sky as Dr. Noel Grundon, Department of Agriculture, University of Queensland; an active Judge of the Queensland Orchid Society and a very knowledgeable grower of our native orchids, has agreed to become our Editor and commences his honorary duties with the December 1987 issue. We have had numerous discussions with Noel and he is in agreement with our Publications Policy and will continue to produce a well balanced Orchadian serving the needs of all our members. However, to ensure that all members are catered for we must make an appeal to all of you to write articles on any subject that concerns our native orchids. I am sure you have something to say, so don't be shy, say it! — How do you grow your *Dendrobium* hybrids — How your *Sarcochilus hartmannii* won your local show — Your recent holiday in the bush — we all want to know about it!

You, our members, are the reason why we produce The Orchadian, and we know you have a wealth of knowledge, please share it with us.

In 1988 The Australasian Native Orchid Society becomes 25 years of age and we are striking a special 25th Anniversary Badge, it is to be of unique design, it consists of a bar with our name and 25 years engraved upon it and from this, on a swivel, hangs a two sided enamel badge with the terrestrial orchid *Pterostylis laxa* on one side and the epiphyte orchid *Sarcochilus weinthallii* on the other. The years 1963 — 1988 appear below the orchid. A limited number of badges will be produced. In the June issue I gave you the names of three more experienced and knowledgeable persons who have accepted positions as Editiorial Associates for The Orchadian, since then another gentleman has accepted, he is Dr. Peter B. Adams, Botany School, University of Melbourne, P.O. Box 211, Heidelberg. Vic. 3084. This now makes a total of eight Editorial Associates.

AUSTRALIAN NATIVE ORCHID HYBRIDS

New Registrations by the R.H.S. from lists in the
Orchid Review Aug. — Oct. 1987.

DENDROBIUM

Aussie Choice	*monophyllum* x *speciosum*	P. Spence
Aussie Ember	Aussie Ira x Peter	P. Spence
Aussie Flame	Aussie Bonanza x Aussie Freckles	P. Spence
Aussie Jewel	Aussie Bonanza x Aussie Mist	P. Spence
Aussie Luck	Star of Gold x Aussie Mist	P. Spence
Aussie Lust	Aussie Ira x Kingrose	P. Spence
Aussie Merit	Ella Victoria Leaney x *ruppianum*	P. Spence
Aussie Nave	Aussie Ira x *ruppianum*	P. Spence
Aussie Parade	Aussie Ira x Star of Gold	P. Spence
Aussie Springtime	Aussie Starlight x Gillian Leaney	P. Spence
Aussie Wonder	Ella Victoria Leaney x Ellen	P. Spence
Coral Sun	Gulginni x *tetragonum*	R. Harris
King-Wong	*kingianum* x Wonga	R. Graham
Mighty Mite	*canaliculatum* x *carronii*	Richella's
Ocker's Dream	Eureka x Ellen	G. Sobey

SARCOCHILUS

Aussie Dawn	*hartmannii x dilatatus*	P. Spence

There is a Catch 22 here — there seems little point in saving plants if nobody is allowed to see them, the plants may be damaged or destroyed.

In a valley below the Elger in Switzerland last year we braved horseflies, sandflies, and, it seemed, every size and shape of stinging and biting brute between — the New Zealander should leave the short pants at home when tramping abroad — because several hundred Slipper orchids grow there. A British expert swore me to secrecy and told me to "Drive to Lauterbrunnen, take the train to Wengen, the walkway to Biglenalp, go down across the bridge, up between the two cowsheds through. . ." I shall say no more.

Dozens of people had been given the same secret instructions though, for there they were, wandering about, trampling young plants in their eagerness to see and photograph the adult plants and flowers. Yet if entry is forbidden, who is to benefit? It's a problem.

Could we let it happen in New Zealand?

From New Zealand Native Orchid Group Newsletter No. 23.

Book Review

The 'Antelope Dendrobiums' by Phillip Cribb

A Revision of *Dendrobium* section *Spatulata*

This book is a must for any serious minded collector of the genus *Dendrobium*. The 'antelope' dendrobiums, as they are known horticulturally, are a popular and spectacular group of orchids widely grown and hybridised throughout the world.

The book is a complete scientific revision of this interesting section and provides a detailed description of the 46 species together with their distribution. It also contains an in depth discussion on each species for both the layman and the botanist alike that clearly relates all the pertinent facts.

There are 20 drawings, many distribution maps and 33 species are represented in photographs. To the Australian native orchid grower this is of particular interest. There are eight Australian species in the section *Spatulata*, they are *D. antennatum, D. canaliculatum, D. carronii, D. discolor, D. johannis, D. mirbelianum, D. nindii* and *D. trilamellatum.*

In this work Cribb reduces D. semifuscum to a synonym of *D. trilamellatum*, stating that "Recent investigation of the types of *D. trilamellatum*, an earlier name at the specific rank, has convinced me that it is conspecific with *D. semifuscum*."

In the paragraph on natural hybridisation mention is made of "Natural hybrids of *D. canaliculatum* with *D. dicuphum* (= *D. affine* Steud.)." The first official mention I have seen of the species, *D. dicuphum* having been reduced to a synonym of *D. affine*, although I have heard much discussion on this.

Reprinted from Kew Bulletin, 1986. 85 pages, 150mm x 245mm, paperbound. Available from The Orangery Bookshop, Royal Botanic Gardens, Kew, Richmond, Surrey TW9 3AB. U.K.

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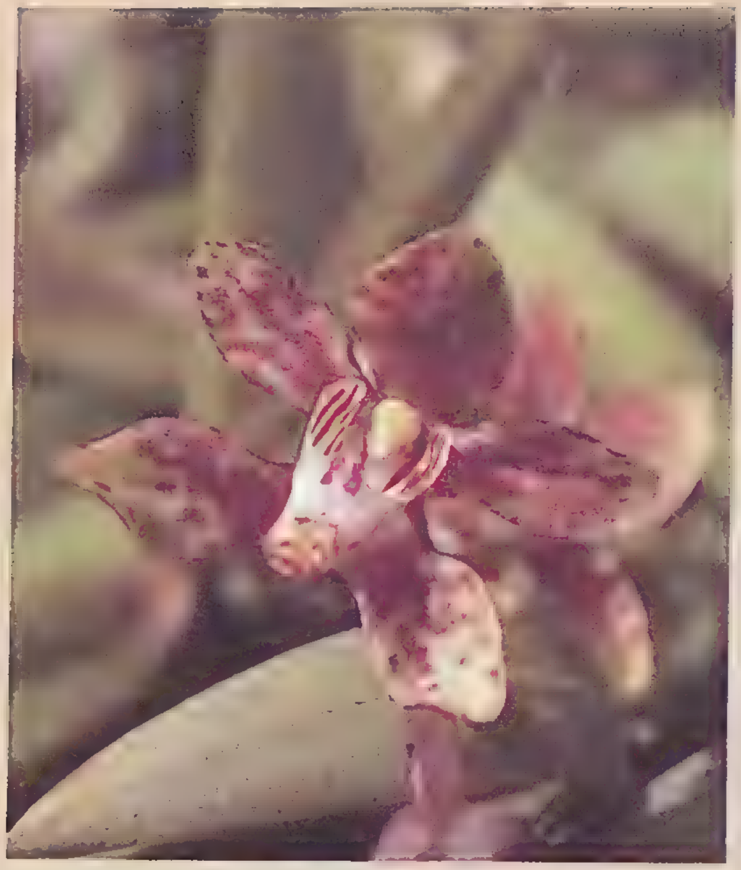

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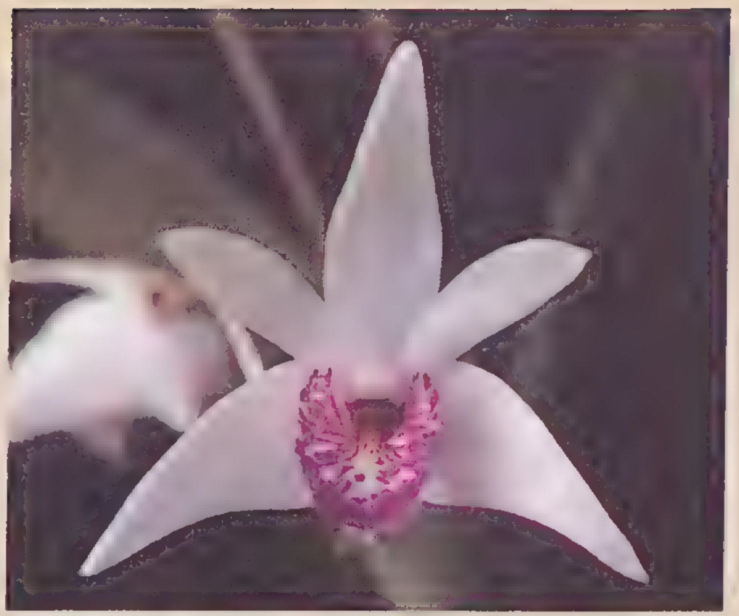

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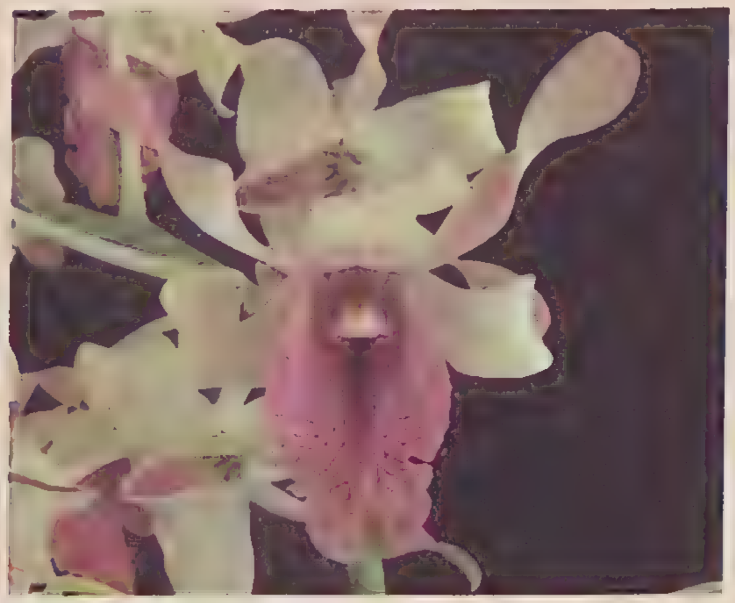

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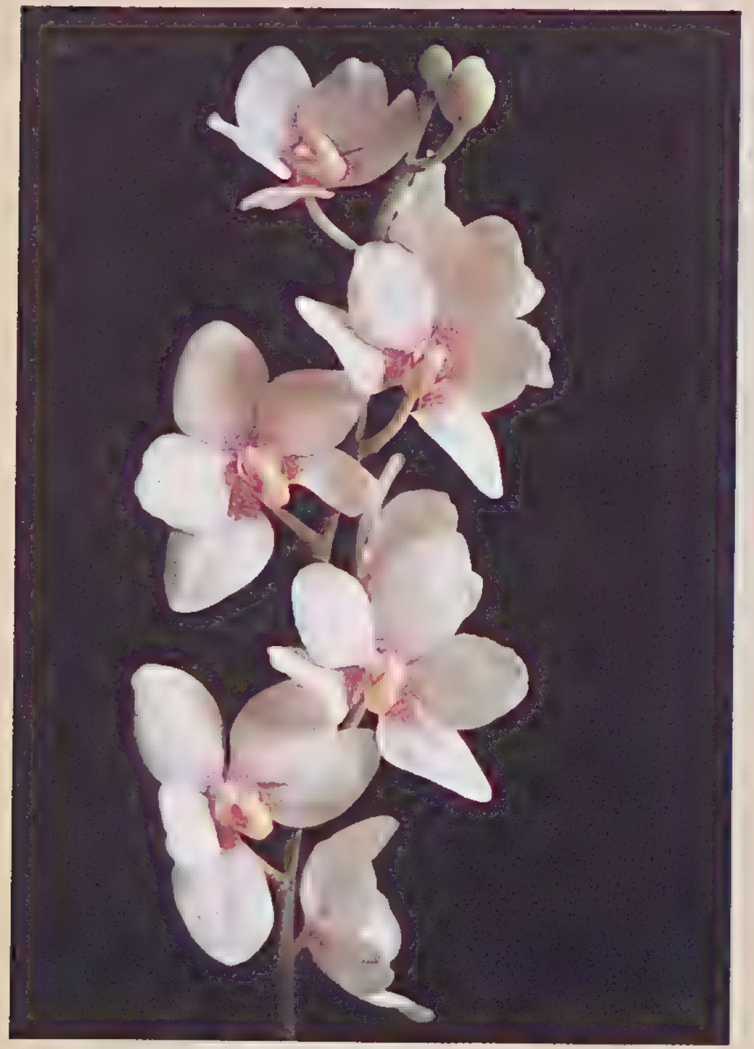

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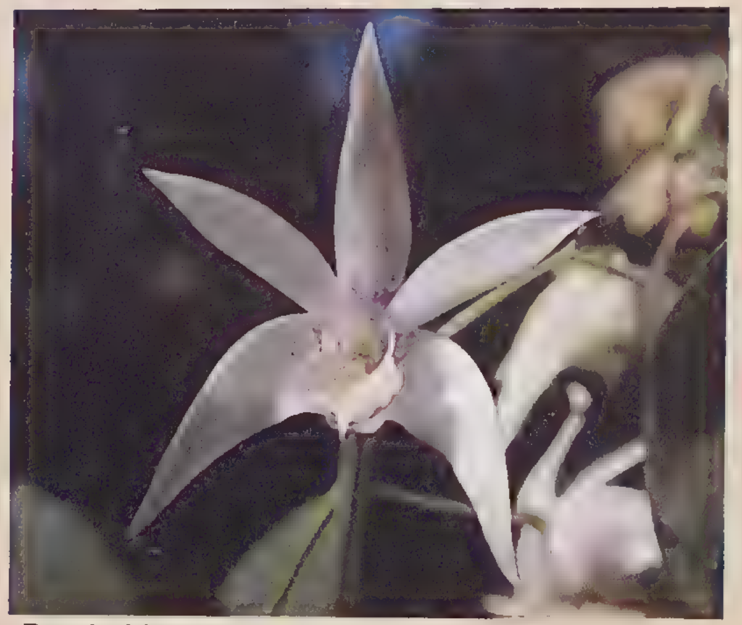

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The Orchadian

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DECEMBER 1987

Oberonia palmicola F. Muell.

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EDITORIAL

Taking over as Editor of The Orchadian is a daunting experience. First comes the realization that you follow a line of successful Editors who have been responsible for developing The Orchadian to its current level of acceptance by the native orchid fraternity. Then, as you grapple with new terms such as picas and fonts, indents and outdents, and the like, you begin to get a glimmer of the immensity of the job ahead and wonder how you ever let Wal Upton and Murray Corrigan talk you into even considering the position.

But the challenge has been accepted. The current acceptance of The Orchadian owes much to the efforts of the previous Editors, people such as Murray Corrigan, Joe Betts, Margaret Spence, and Michael Penberthy. They have taken it from a simple 'broadsheet' style publication, not unlike a Society's Newsletter, to a bicolumnar, professional layout with a full colour cover, and at least two pages inside of full colour illustrations. Over the years the content has changed from essentially newsletter style items to include something of relevance to all growers of Australasian native orchids, amateur and professional, enthusiast and researcher.

As Editor, it is my responsibility to maintain, and if possible, improve on the standards already achieved. But The Orchadian is not my journal. It is your journal. As Wal Upton said in his last Editorial, "You, our members, are the reason why we produce The Orchadian, and we know you have a wealth of knowledge, please share it with us".

Wal Upton and Murray Corrigan have worked long hours setting up the Editorial Associate system. For that, I thank them profusely. Thanks to the response from the Editorial Associates, it has already brought good articles to feature in this and future issues of the journal, with the promise of more to come. But we need more than feature articles if we are to offer something of relevance to all people interested in Australasian native orchids. We need articles on events at the Society or ANOS Group level; what won the prizes at your last Spring or Autumn Show — been for a stroll in the bush with your camera (please include a slide or two) — how did you grow the **Dendrobium bigibbum** *you won cultural vote with at the last meeting — I look forward to including such articles in future issues.*

Of course, feature articles will continue to dominate and make up the bulk of each journal. In this issue David Jones and Mark Clements describe seven new species and a new combination from the orchid taxa of south-eastern Queensland. Nev Howcroft presents Governor Hahl's bulbophyllum, **Bulbophyllum hahlianum.**

To encourage a wider spectrum of articles, I am intending to introduce a number of Departments. **Editorials** *will recommence and I will be continuing with the* **'From the Back of the Bushhouse'** *series which was initiated by Wal Upton on a suggestion by P.S. 'Bill' Lavarack. In this issue, Len Lawler tells us some of the reasons why he and Kate have moved to Atherton, North Queensland. Having visited them recently, met and talked orchids with them, Rev. Ron Collins, and Tommy Wolfe, and shared the view of the forested mountains from the back of their bushhouse, I can appreciate the attractions of their new home.*

Another Department to continue will be Letters to the Editor, now renamed **Readers' Forum.** *In this issue, Peter Vaughan presents his thoughts on "A Question of Parentage", supporting Prof. Holttum's system of naming hybrids. Do you agree with Peter or have you another opinion? We all want to know about them through* **Readers' Forum.**

Listing the recently registered hybrids between Australian native orchids continues in this issue and will be continued in future issues. But should we list **Australasian** *native hybrids instead? Perhaps some comments on this subject through* **Readers' Forum** *would be appropriate.*

In future issues, I would like to commence Departments to include comments from **ANOS Council,** *articles about* **Club Activities,** *and reports from* **Around the Shows.** *How successful I will be depends on your contributions. I would enjoy being embarrassed by an oversupply of articles which would necessitate increasing the number of pages in The Orchadian.*

Noel J. Grundon

FROM THE BACK OF THE BUSHHOUSE

by Len Lawler

This issue takes us to the Atherton Tableland, North Queensland, where Len and Kate Lawler have recently moved after retiring from their respective careers at the University of Sydney. Here, Len tells us some of the reasons for their move to Atherton — Editor

Just twelve months ago my bush-house moved 2000km north of Sydney to Atherton. From the back of the bush-house I look at a creek against a backdrop of rainforest-topped hills. The trees along the banks of Scrubby Creek, for that is its name, were once festooned with *Dendrobium tetragonum*, but now the sole orchid to be seen is a species of *Taeniophyllum*. The old-timers tell me also that the wet patch at the back of our place where a soak runs to the creek, once contained many plants of *Phaius tancarvilliae* which were exterminated by cattle when the area was a dairy farm. I hope to replace this colony if I can keep the feral pigs out. I've walked up the creek some distance and recorded *Dendrobium tetragonum* var. *giganteum*, *Den. ruppianum*, *Cymbidium madidum*, *Plectorrhiza brevilabris*, *Calanthe triplicata*, *Pterostylis hildae* and a huge colony of *Corybas abellianus*.

To a native orchid enthusiast Atherton is an exhilarating area. What I find most stimulating is being among so many talented people who have contributed to the study of orchids in diverse ways. It is always interesting to talk with the doyen of Australian orchildologists, Alick Dockrill. The Rev. Ron Collins likes orchids almost as much as his cup of tea and has a profound knowledge of cultivation of natives. Geoff Stocker, who recently received his Ph.D., has a fine collection of orchids with emphasis on dendrobes from the highlands of New Guinea. Mal Brown of *Dendrobium malbrownii* fame, tells stories of his boyhood at Rossville, near Cooktown, and of his later days at Coen when he traversed the McIlwraith Range from end to end to gain an intimate knowledge of the orchids of this exciting area.

Joe and Virginia Mackin, expatriate Americans who settled in Atherton, have a fine collection of orchids of this area -to look at the orchids and sample good coffee is always a treat. Of those who have lived hereabouts for all their lives, I must mention together Bruce Gray and Tommy Wolfe. Inseparable companions in the scrub, each knows the district like the back of his hand. No matter what orchid, they know where it grows — but they may not show you! Bruce is currently engaged in reviewing the Australian taxa in two genera. A young lad, of whom more will be heard in the future, is Chris Godfrey who is line-breeding some native species and hybridizing on a long-range plan. Last, but not least, is Mair Swann, who is a botanical illustrator trained at the Royal Botanic Gardens, Kew. Mair's exquisite paintings of Australian orchids will constitute a permanent record.

This is truly a pot-pourri of talent, interest and information, right here in Atherton. Of course, there are others in far north Queensland, whom I hope to mention in a later article. Where do I stand in all this? Mostly I look and listen, absorbing the orchid lore of this unique region. I have plenty of ideas, and a few plans. I hope that I will be able to write about these in the future.

In the meantime I often stand with Kate, at the back of the bush-house, watching the birds and the butterflies, admiring the flowering shrubs and trees, looking at the eucalypt forest and the rainforest and wondering what orchids, as yet undescribed, are hidden up there.

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NEW ORCHID TAXA FROM SOUTH-EASTERN QUEENSLAND

David L. Jones and Mark A. Clements

Australian National Botanic Gardens, G.P.O. Box 1777, Canberra, ACT, 2601.

(Reprinted from Proceedings of the Royal Society of Queensland 98: 123-132 (1987) with the permission of The Royal Society of Queensland and the authors.)

Abstract: Seven new species (Orchidaceae) are described from south-eastern Queensland: *Chiloglottis sylvestris*, *C. truncata*, *Pterostylis bicornis*, *P. bicolor*, *Dipodium variegatum*, *D. pulchellum* and *Diuris chrysantha* and the new combination, *Diuris parvipetala*, is made for *Diuris punctata* var. *parvipetala* Dockr.

Introduction

This paper is presented to validate names for the forthcoming third volume of the 'Flora of South-eastern Queensland'. It is based on research carried out in south-eastern Queensland, principally by the senior author (D.L.J.) over the last two years. The genera included in this paper will be the subject of comprehensive treatments at a later date. Preliminary work on *Dipodium* has been published (Clements, 1979).

New Species

Chiloglottis sylvestris D. Jones et M. Clements **sp. nov.** affinis *C. reflexae* (Labill.) Druce sed sepalis lateralibus clavis apicalibus brevioribus praeditis et labello multo parviore ornato callo centrali formiciformi dimidium laminae occupanti differt.

Typus: Queensland, Springbrook, 12 Jan. 1986, D.L. Jones 2231 (BRI, holo; CBG, iso).

Tubers to 15 mm x 8 mm, obovoid to ovoid, brown, fleshy. Leaves 3-6 cm x 12-20 mm, elliptical, erect at first, becoming ground-hugging, dark green on the upper surface, lighter beneath, the veins not prominent, the margins entire to irregularly crisped. Peduncle 3-5 cm x 1-2 mm, slender, green or pinkish-purple. Floral bract 12-15 mm long, lanceolate, acuminate, closely sheathing. Pedicel about 10 mm long, slender, elongating to 18 cm and thickening prior to seed dispersal. Flower solitary, about 2 cm long, greenish pink. Dorsal sepal 10-13 mm x 2-2.5 mm, curved and column-embracing, narrow in the basal half then abruptly dilated before narrowing into an attenuate apex 2-3 mm long. Lateral sepals 10-14 mm x 0.4 mm, filiform, connate at the very base, erect for the basal 3-4 mm then decurved; club-like apices 3-4 mm long, yellowish. Petals 7-10 mm x 2-2.3 mm, obliquely lanceolate, reflexed against the ovary. Labellum on a very short claw about 1 mm long; lamina 7-10 mm x 5-6 mm, obovate to rhomboid, narrow-tapered in the basal 3-4 mm, erect in the distal third then slightly decurved, anterior margins slightly recurved, distal margins more or less entire. Lamina callus reddish-black, occupying most of the proximal ventral portion of the lamina; major stalked gland about 1.5 mm long, erect with a narrow, elongated head; on the proximal side a prominent group of sessile glands about 3 mm x 1.5 mm, the whole shape resembling an ant; on both side of this ant-like formation a series of circular, low, sessile glands mixed with numerous stalked, clavate, reddish glands about 1 mm long; a pair of prominent short, thick glands at the labellum base. Column 6-8 mm long, curved, greenish white with a few red spots on the adaxial surface, narrowly winged, the wings expanding slightly in the distal third, their tips level with the anther. Anther cap 2 mm x 2 mm, smooth with a short rostrum. Pollinia about 1 mm long boomerang-shaped, bright yellow, mealy. Stigma about 2 mm across, circular, sunken. Capsule 12-14 mm x 5-6 mm, obovoid. Fig. 1A-C.

Distribution: South-eastern Queensland (Moreton Region).

Habitat: Rainforest, rainforest margins and moist areas of tall open forest in high rainfall regions. This species seems to be restricted to red loamy, basaltic soils.

Flowering Period: December-March.

Affinities: *C. sylvestris* is morphologically similar to *C. reflexa* but is probably not closely related to that species. It can be distinguished easily by the much more slender perianth segments, in particular the dorsal sepal and the lateral sepals which have shorter, yellow club-like tips (red in *C. reflexa*) and the small labellum lacking a glandular, apical mucro, and having a small, ant-like callus.

Conservation Status: This species is very common in south-eastern Queensland and is well conserved in National Parks.

Etymology: The specific epithet refers to the occurrence of this species in forested habitats, particularly rainforest which is unusual for the genus.

Chiloglottis truncata D. Jones et M. Clements **sp. nov.** affinis *C. formiciferae* Fitzg. sed floribus labello spathulato apice truncato praedito differt.

Typus: Queensland, Anduramba, W. of Toogoolawah, D.L. Jones s.n., Aug. 1984 (BRI, holo; CBG, iso).

Tubers to 10 mm x 8 mm, ovoid, creamy brown, fleshy. Leaves 5.5-6 cm x 14-16 mm, narrow-elliptical, ground-hugging, dark green on the upper surface, paler beneath, the margins undulate; petiole 5-7 mm long. Peduncle 5-8 cm x 1.5 mm, green, fleshy. Floral bract 12-12 mm long, lanceolate, closely sheathing. Pedicel 15-25 mm long, very slender, erect. Flower solitary, 14-16 mm long, green. Dorsal sepal 10-11 mm x 2-2.5 mm, narrow and tapered in the basal half, then gradually expanded before narrowing into a blunt apex about 1 mm long. Lateral sepals 9-10 mm x 0.8 mm, linear, connate at the very base, divergent, obliquely erect then decurved in the distal quarter, flat; club-like apices 0.8-1 mm long, yellowish. Petals 7.5-8 mm x 2-2.5 mm, unequally ovate, falcate, reflexed against the ovary. Labellum on a very short claw about 1 mm long; lamina 7.5-8 mm x 4-4.5 mm, spathulate, erect in the proximal half then decurved, 0.9-1 mm wide at base, narrow for the basal 3 mm then widened to 1.5 mm, (its margins red) then gradually expanded to the lateral margins which are level with the obtuse apex to appear truncate. Lamina callus black, shiny, occupying most of the adaxial surface of lamina; major proximal stalked gland about 2.3 mm long, obliquely erect, apex about 1.5 mm wide, emarginate, the distal side of the stalk with a cluster of shiny, black sessile glands about 1.2 mm across; distal to the major proximal gland a shortly stalked, shiny, black, flat gland of irregular, rounded shape about 1 mm across and distally a series of sessile, black glands extending in a central band to the apex of the lamina; a few, long-stalked, pink to red, clavate glands to 0.8 mm long, flank the central area of callus; calli absent from base of labellum stalk. Column 7-8 mm x 2-2.5 mm, curved, green with a few red spots; wings narrow, their apical part obtuse, higher than the anther. Anther cap about 2 mm x 2 mm, smooth, obtuse. Pollinia about 2 mm long, clavate, bright yellow, mealy. Stigma about 2 mm across, oblong, sunken. Capsule not seen. Fig. 2A-C.

Distribution: South-eastern Queensland (Moreton).

Habitat: Open forest.

Flowering Period: July-September.

Affinities: *C. truncata* has obvious affinities with *C. formicifera* but is easily distinguished by the spathulate labellum which has a truncate apex.

Conservation Status: At present known only from the Moreton region but there widespread and common.

Etymology: The specific epithet refers to the truncate apex of the labellum.

Pterostylis bicornis D. Jones et M. Clements **sp. nov.** affinis *P. parviflorae* R. Br. sed petalorum apicibus filiformibus 4-5 mm longis et stigmate basali distinguenda.

Typus: Queensland, Mount Maroon, 27 June, 1978, J. Clarkson and M. Olsen (BRI, holo).

Small, slender terrestrial orchid with a rosette produced on a separate growth arising from the base of the floral scape. Rosette leaves 3-7, the lamina cordate, 3-7 mm x 3-5 mm, on broad petioles 2-4 mm long. Scape 6-10 cm tall, very slender, with 1-2 terminal flowers. Sterile bracts 3 or 4, to 10 mm x 3 mm, lanceolate, acuminate, sheathing at the base. Fertile bracts similar. Flowers 8-10 mm long, dark green and white; dorsal sepal 6-8 mm long, galeate, erect at the base then curved in the distal third, apex truncate or emarginate. Lateral sepals about 6 mm long, united in the basal two-thirds, the free segments closely embracing the galea and barely exceeding it, the lateral margins covering the petals. Petals 6-7 mm x 1.5 mm, curved, the apex produced into a filiform or slightly clavate tail 4-5 mm long which far exceeds the dorsal sepal. Labellum 3.4-4 mm x 1 mm, oblong, constricted in the distal quarter, curved sigmoidally, the basal appendage shortly branched. Column 3.5-4.5 mm long, erect, slender; wings about 1.5 mm long, their upper margin produced into a filiform point, the lower margins obtuse, sparsely ciliate. Anther cap about 0.8 mm long, obtuse, with a very short rostrum. Stigma about 1 mm x 0.5 mm, cordate, basal, the upper margins irregular. Pollinia about 0.8 mm long, linear, mealy. Capsule not seen. Fig. 4A-D.

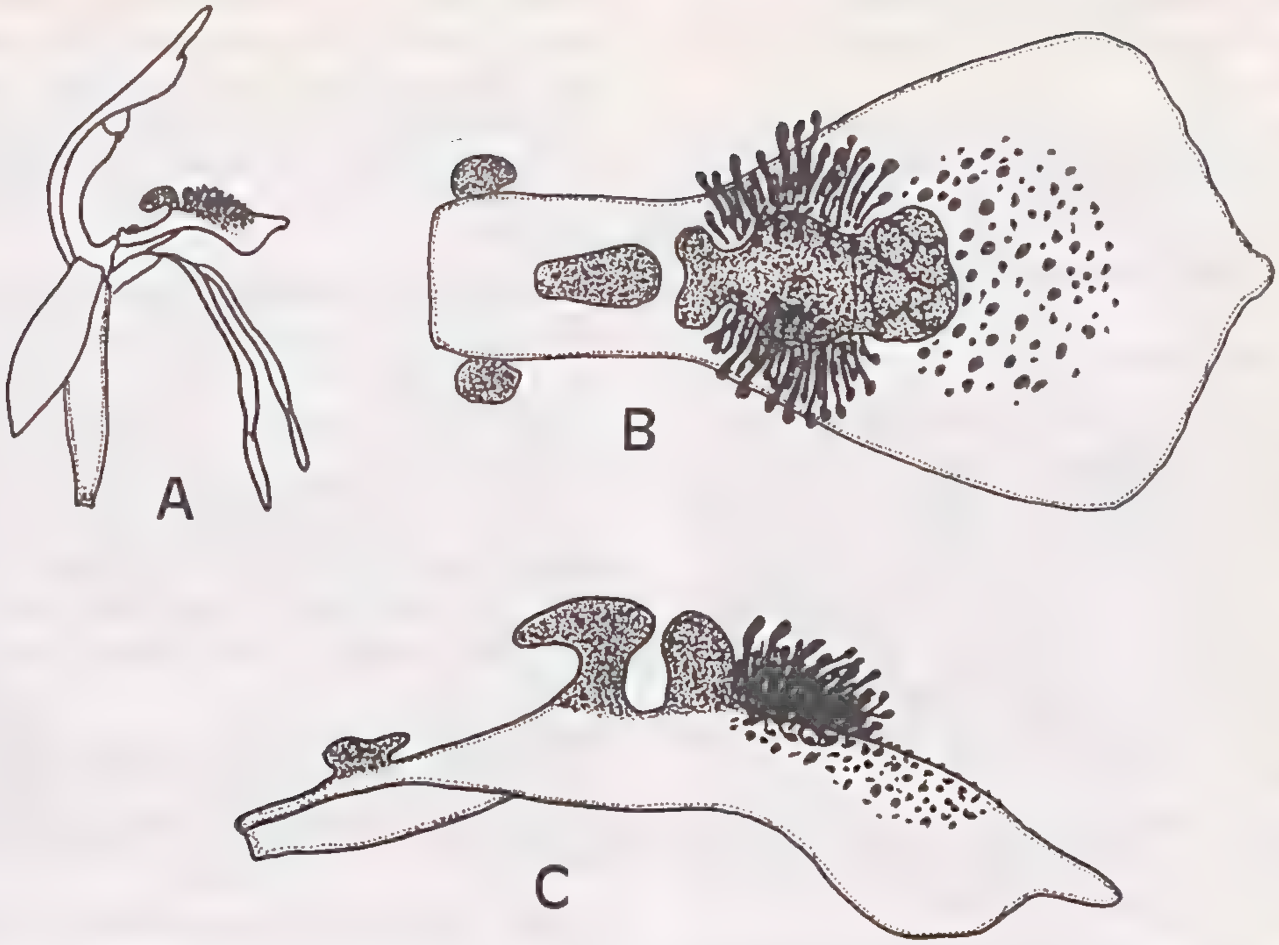


Figure 1. *Chiloglottis sylvestris* A, flower from side x 1. B, labellum from above x 5. C, labellum from side x 5.

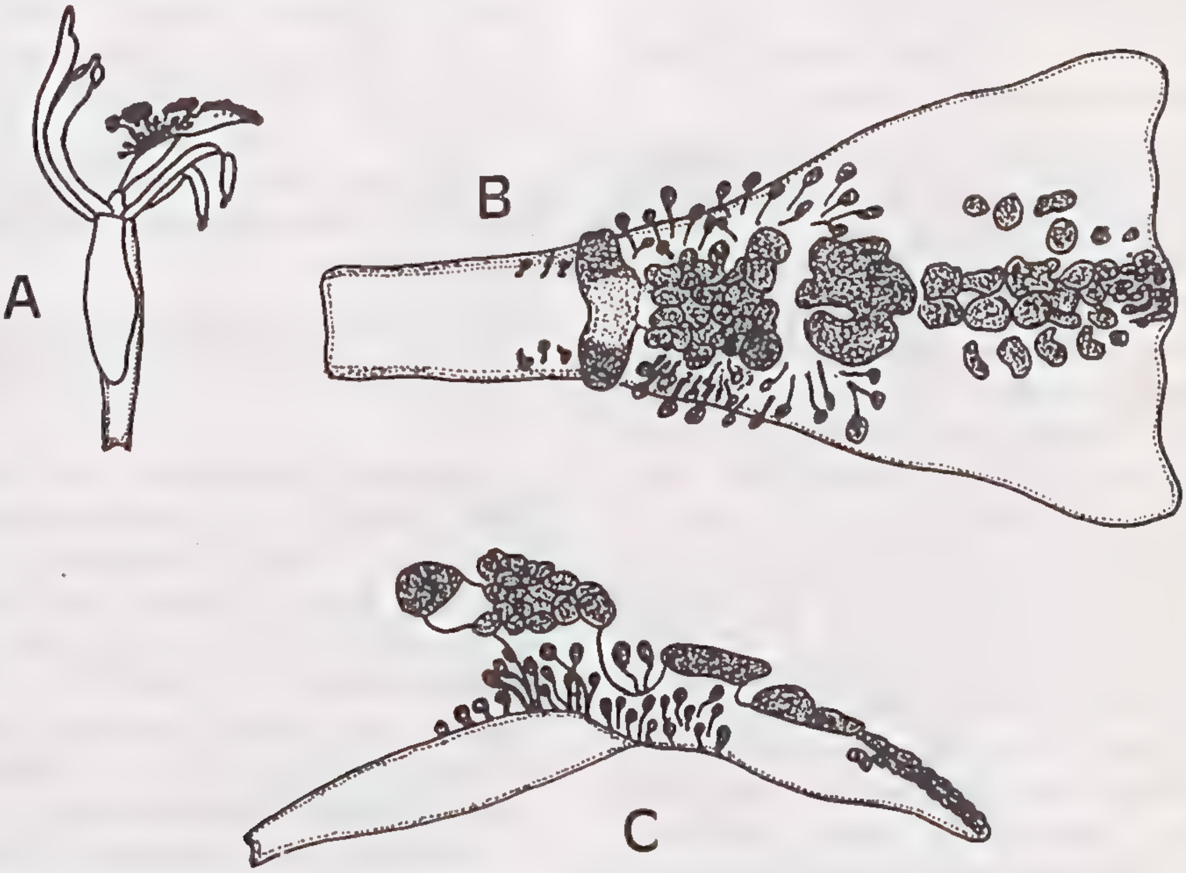


Figure 2. *Chiloglottis truncata* A, flower from side x 1. B, labellum from above x 5. C, labellum from side x 5.

Collections Examined: Mount Maroon, 3 June 1962, S.L. Everist 7192 (BRI); 11 June 1977, F.D. Hockings s.n. (BRI).

Distribution: Known only from Mount Maroon, an outlier of the McPherson Range in south-eastern Queensland.

Habitat: In small, humus pockets on bar rock (Everist 7192).

Flowering Period: June-July.

Affinities: *Pterostylis bicornis* has affinities with both *P. aphylla* Lindley and *P. parviflora* R. Br. It can be distinguished readily from these species by the filiform tips on the petals, a character which is unique in the genus. Apart from a general similarity in the flowers the species has the same growth habit as *P. parviflora*, especially notablebeing the small basal rosette arising on a separate stem to the flowering scape. It shares a basally situated stigma with *P. aphylla*.

Conservation Status: Its very restricted distribution determines its status as 2V based on Leigh, Briggs and Hartley (1981).

Etymology: The specific epithet refers to the long filiform points which terminate the petals and give the flower a horned appearance.

Pterostylis bicolor M. Clements et D. Jones **sp. nov.** affinis *P. muticae* R. Br. sed caule carnosiore plura bractea ferenti et labelli appendice multo crassiore atroviridinigera differt.

Typus: New South Wales, 24 km north of Cowra on Forbes road, 16 Oct. 1984, M.A. Clements 3539 (CBG, holo; BRI, NSW, K, iso).

Plant terrestrial, tuberous. Leaves 18-24 mm x 9-12 mm, ovate to ovate-lanceolate, 5-12 in a radical rosette. Inflorescence 15-40 cm tall, slender, with 6-11 closely ensheathing, lanceolate sterile bracts. Flowers 3-14, green, semi-erect, held close to the axis. Dorsal sepal 7-8 mm long, cucullate, obliquely erect, abruptly decurved to a blunt apex. Lateral sepals 5-6 mm x about 4 mm, reflexed towards ovary, concave united nearly to the apex, the distal margins incurved. Petals about 8 mm x 4 mm, rhomboid, clasping the upper margin of the dorsal sepal to form a galea. Labellum on an irritable claw about 7 mm long; lamina about 3 mm x 2 mm more or less rectangular, light green, membranous, emarginate; basal appendage about 3 mm long, prominent, greenish-black, with an obtuse beak about 0.3 mm long pointing towards the labellum apex. Column about 8 mm long, curved, white, fleshy; column wings about 2.5 mm x 2 mm, more or less rectangular, the curved outer margin sparsely hairy. Anther cap about 1 mm long, with a short, obtuse rostrum. Pollinia four, about 1.2 mm x 3 mm, clavate or falcate. Stigma about 2.5 mm x 1.3 mm, elliptical. Capsule small, obovate. Fig. 3A-C.

Selected Collections Examined: Wondai 27 July, 1952, W.W. Abell s.n. (BRI); Stanthorpe, 7 Oct. 1961, W.W. Abell and Blackney s.n. (BRI); Isla Gorge, ca 28 km south-west of Theodore, 20 Aug. 1973, P.R. Sharpe and F.D. Hockings 552 (BRI), west of Inglewood Hills, Sept. 1910, J.L. Boorman 9 (NSW); Tingha, Oct. 1903, R. Cambage 979 (NSW); Bass Hill, 12 Sept. 1953, A.W. Dockrill s.n. (BRI); Raymond Terrace, Aug. 1938, H.M.R. Rupp s.n. (NSW); Armidale, 12 July 1968, R. Windsor s.n. (NSW).

Distribution: South-eastern Queensland as far north as Wondai and New South Wales, on the coast, ranges and western slopes as far south as Holbrook.

Habitat: Open forest and woodland, often on rock outcrops.

Flowering Period: September-November.

Affinities: *P. bicolor* has been confused with *P. mutica* but can be readily distinguished by its much thicker labellum callus which is dark greenish-black. It also commences flowering towards the end of the flowering period of *P. mutica* in most areas.

Conservation Status: The widespread, common species is well conserved in National Parks and Flora Reserves.

Etymology: The specific epithet refers to the two colours of the labellum which form a striking contrast.

Dipodium variegatum M. Clements et D. Jones **sp. nov.** affinis *D. punctato* (Smith) R. Br. sed graciliore, maculis prominentibus fuscatis in perianthii segmentis ovario pedicelloque ornata, ovario gibboso verrucoso et callo labelli lobos lineares divergentes ferenti differt.

Typus: Queensland, Beenleigh, beside Pacific Highway, 19 Dec. 1985, D.L. Jones 2226 and T.D. Jones (BRI, holo; CBG, NSW, iso).

Terrestrial saprophytic herb. Stem bracts to 30 mm x 6 mm, lanceolate, imbricate, carinate, acute, greenish to purplish-red. Inflorescence mostly 30-60 cm tall, fleshy, greenish to reddish-purple,

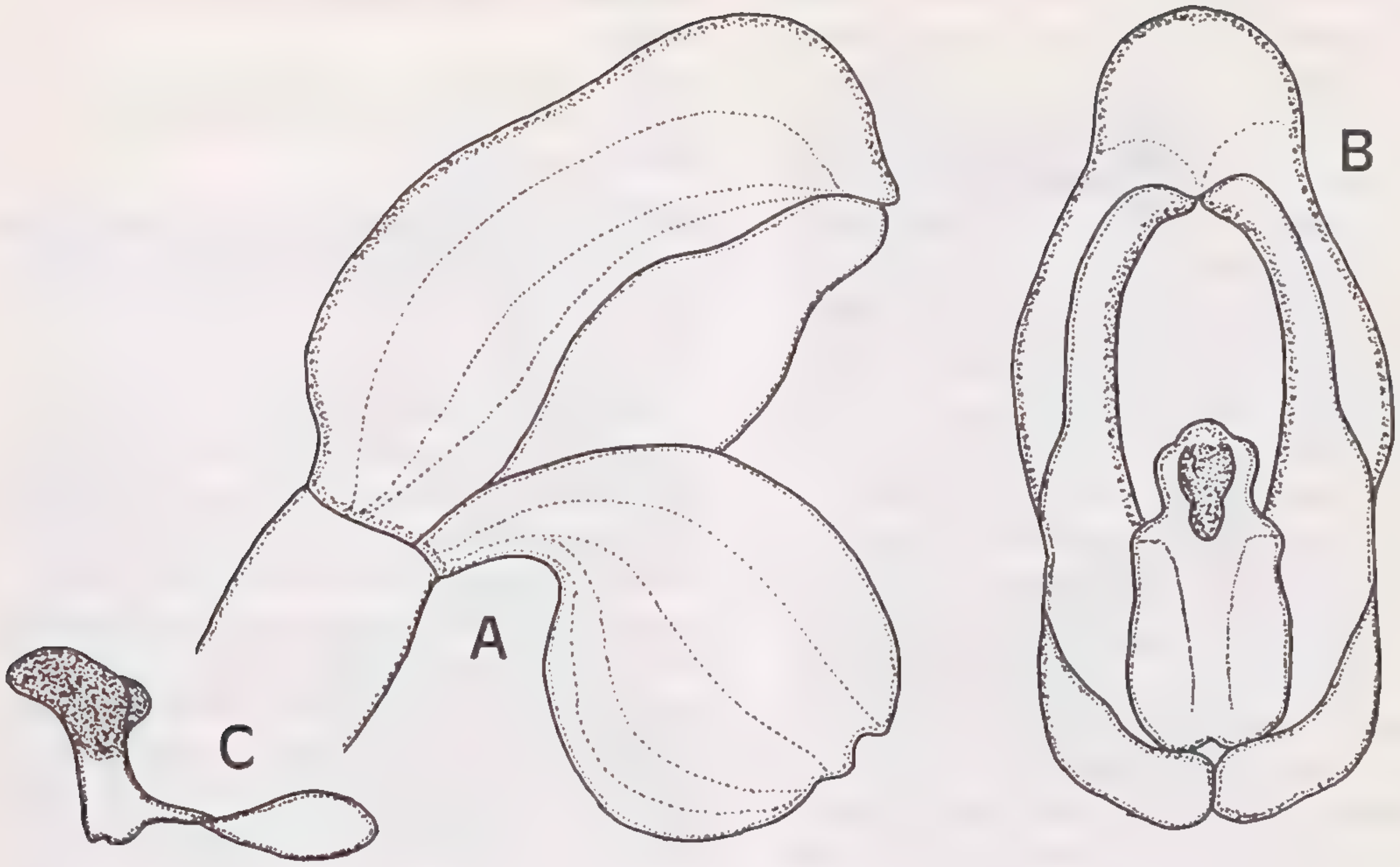


Figure 3. *Pterostylis bicolor* A, flower from side x 4. B, flower from front x 4. C, labellum from side x 5.

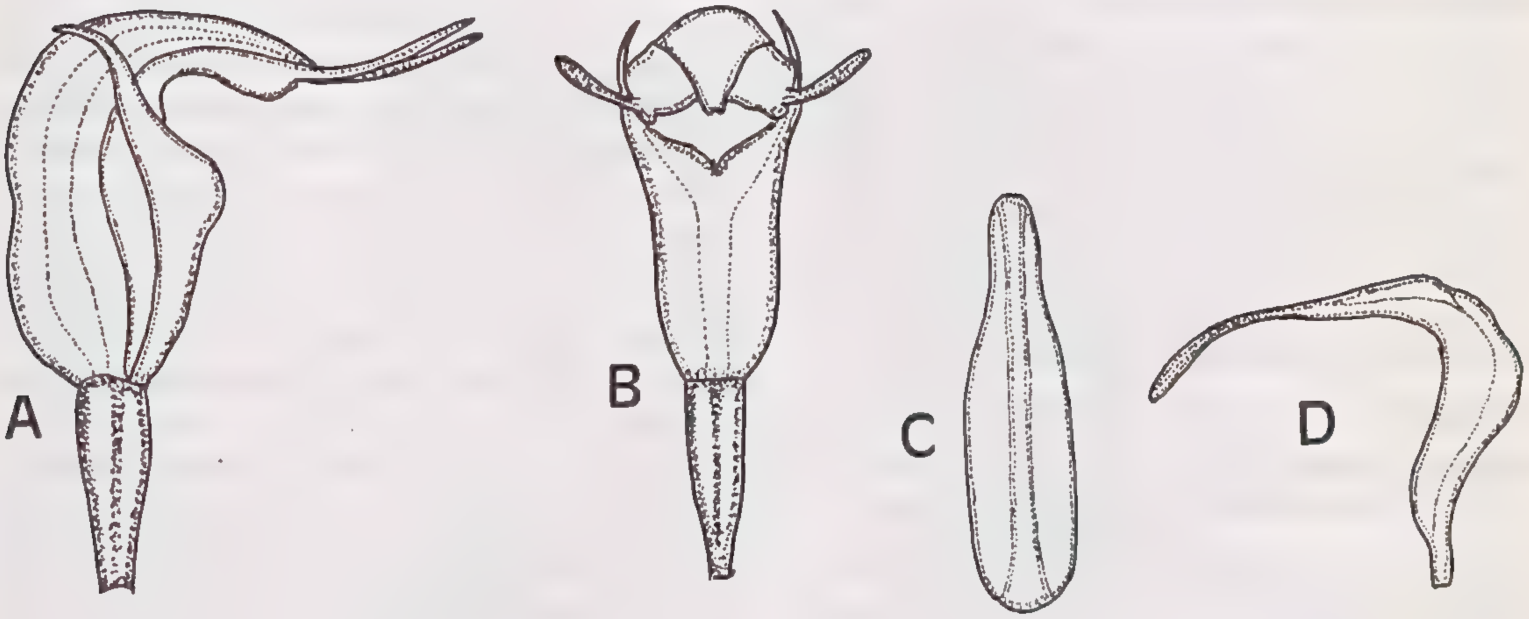


Figure 4. *Pterostylis bicornis* A, flower from side x 2.5. B, flower from front x 2.5. C, labellum from above x 5. D, petal x 2.

bearing 2-50 flowers, the peduncle much longer than the rhachis. Pedicels 10-14 mm long, slender, with maroon spots. Ovary 5-7 mm x 2-2.5 mm, gibbous, verrucose, cream or light green with darker spots and blotches. Flowers 18-24 mm across, cream or light pink with heavy maroon blotching, the segments widely spreading, reflexed near the tips. Dorsal sepal 12-18 mm x 3-5 mm, linear-lanceolate to lanceolate. Lateral sepals 13-19 mm x 3-5 mm, linear-lanceolate, widely divergent, slightly falcate. Petals 12-17 mm x 3-4 mm, lanceolate, slightly falcate, obliquely erect. Labellum 12-15 mm long, mauve or maroon, projected forwards, lateral lobes 4-5 mm x about 1 mm, linear-spathulate, upcurved, pubescent insideat the base; mid-lobe 8-12 mm x 3.5-5 mm, mauve, extending in a central band from the callusto the apex, where broad and densely tangled. Callus of two linear, pubescent, divergent keels about 3 mm x 0.6 mm. Column about 8 mm x 3 mm, white, fleshy, projected forwards, saccate, with a central, anterior, pubescent patch. Anther cap about 1.2 mm x 1.2 mm with a short, narrow rostrum. Stigma about 1.2 mm across, ovate, sunken. Pollinarium about 1.5 mm long; retinaculum about 0.4 mm long, ovate; caudicles about 1 mm long; pollinia about 0.6 mm long, elliptical, moderately grooved. Fig. 5A-D.

Distribution: North-eastern to south-eastern Queensland to New South Wales and eastern Victoria.

Selected Collections Examined: Moreton Island, 29 Mar. 1973, L. Durrington 327 (BRI); Mt Glorious, 1 Feb. 1968, B. Lebler and P. Baxter 070860 (BRI); Stanthorpe, Jan. 1912, F.G. Corie 070891 (BRI); Caboolture, 1 July 1959, R.E. Philips 070867 (BRI); Alum Mountain, Bulahdelah, 12 Dec. 1979, M.A. Clements 1744 (NSW); Katoomba, 15 Dec. 1923, G.V. Scammell s.n. (NSW); 19 km north Bateman's Bay, 18 Jan. 1981, M.A. Clements 2273 (NSW); Mallacoota, 1 Feb. 1986, H.M. Richards s.n. (MEL).

Habitat: Open forest, woodland and heathland.

Flowering Period: Sporadically over most of the year, but predominately in the summer months.

Affinities: *D. variegatum* is the most widespread species of *Dipodium* in Australia. It is most closely related to *D. punctatum*, but can be recognised by its heavily blotched flowers, the spots on the ovaries and pedicels and the gibbous ovaries with a roughened surface. In addition its labellum callus has very slender, divergent keels and the mid lobe has a dense patch of tangled hairs which obscures the apex.

Conservation Status: This widespread, common species is well conserved in National Parks and Flora Reserves.

Etymology: The specific epithet refers to the darker patches and spots disposed irregularly on the light-coloured ovaries and pedicels of this species.

Dipodium pulchellum D. Jones et M. Clements **sp. nov.** affinis *D. punctato* (Smith) R. Br. sed floribus valde atrorubricarneis valde maculatis quorum segmenta non recurva et callus labelli lobos lineariclavatos divergentes ferens differt.

Typus: Queensland, Tallebudgera Range, 28 Dec. 1985, D.L. Jones 2230, (BRI, holo).

Terrestrial saprophytic herb. Stem bracts to 27 mm x 20 mm, ovate-lanceolate, imbricate, obtuse, greenish. Inflorescence 40-90 cm tall, fleshy, green, bearing 5-20 flowers, the peduncle much longer than the rhachis. Pedicels 10-15 mm long, slender. Ovary 10-14 mm x 2-3 mm, smooth, straight or slightly curved, not gibbous. Flowers 18-25 mm across, deep rosy pink heavily suffused with darker spots and blotches, the segments widely spreading but not reflexed or recurved. Dorsal sepal 13-15 mm x 4-5 mm, ovate-lanceolate. Lateral sepals 13-15 mm x 4-5 mm, ovate-lanceolate, widely divergent. Petals 12-14 mm x 4-4.5 mm, lanceolate, slightly falcate, obliquely erect. Labellum 12-14 mm long, dark reddish-pink, projected forwards, 3-lobed; lateral lobes 4-5 mm x about 1 mm, linear-spathulate, truncate, upcurved, pubescent inside near the base; mid-lobe 9-10 mm x 5-6 mm, broadly elliptical. Labellum hairs about 0.3 mm long, mauve, extending in a narrow central band from the callus to the apex, the band slightly broader near the apex. Callus consisting of two linear-clavate, pubescent, divergent keels about 5 mm x 0.8 mm. Column about 10 mm x 3 mm, white, fleshy, projected forwards, saccate, with a central, anterior pubescent patch. Anther cap about 1.2 mm x 1.2 mm, with a very short, obtuse rostrum. Stigma about 1.2 mm across, ovate, sunken. Pollinarium about 1.5 mm long; retinaculum about 0.4 mm long, ovate; caudicles about 0.7 mm long; pollinia about 0.5 mm long, elliptical, moderately grooved. Fig. 6A-D.

Distribution: South-eastern Queensland (McPherson Range and adjacent ranges).

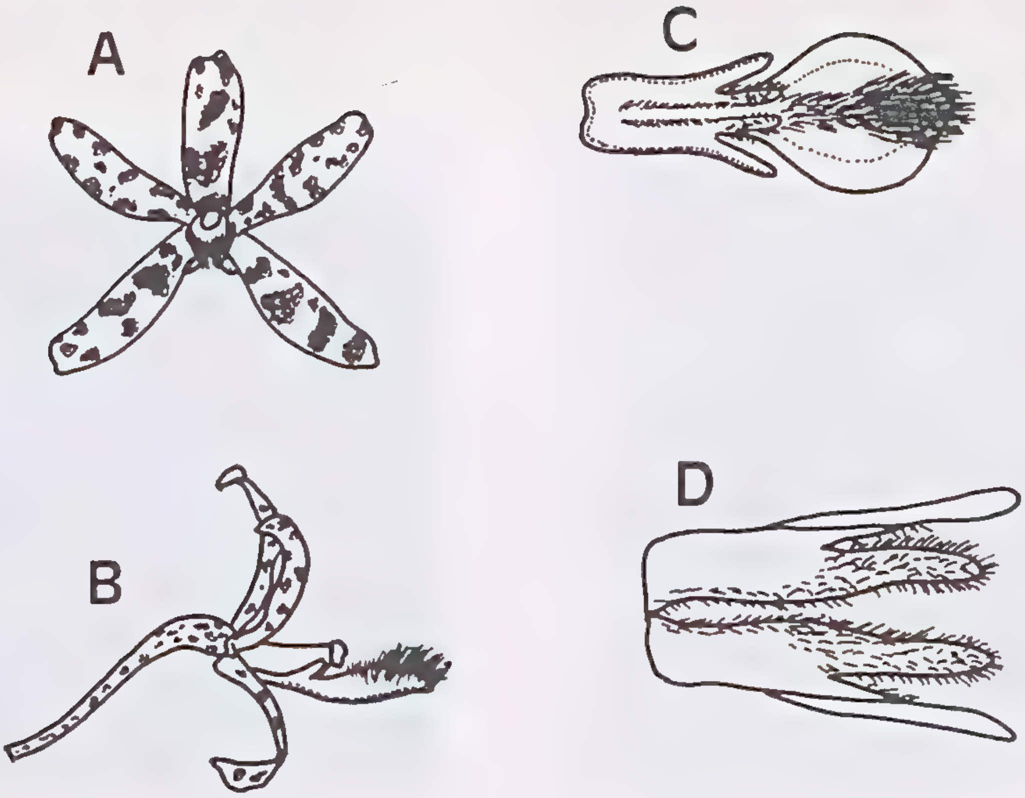


Figure 5. *Dipodium variegatum* A, flower from front x 1. B, flower from side x 1. C, labellum from above x 1.5. D, labellum callus x 2.5.

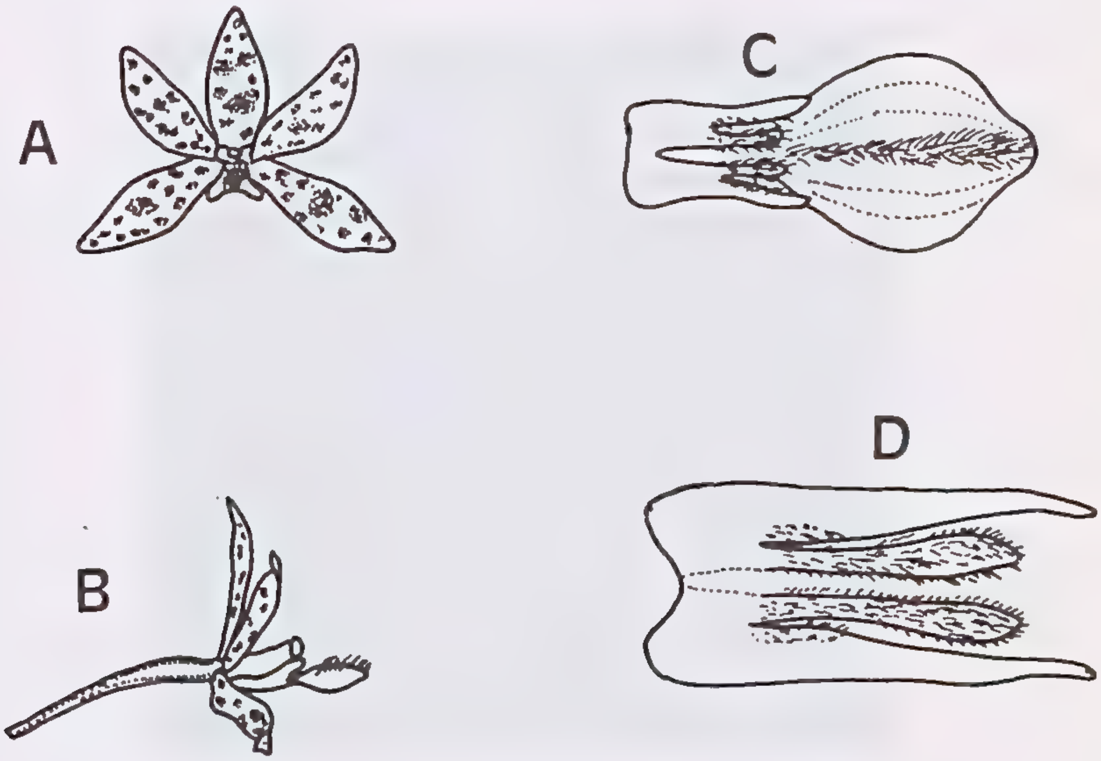
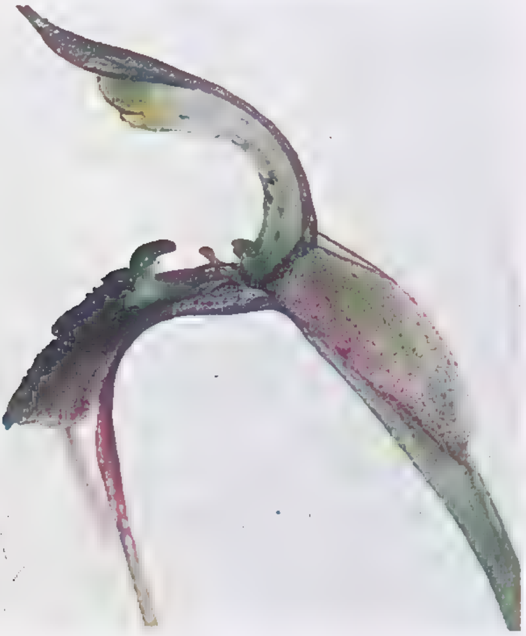
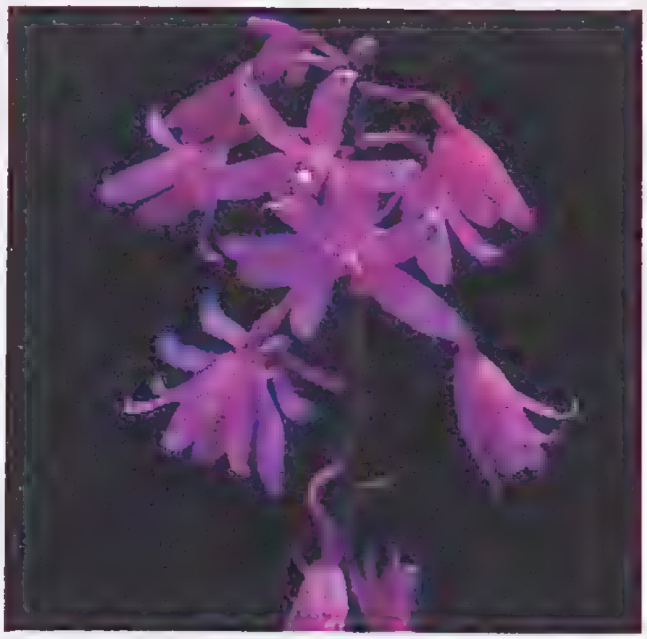


Figure 6. *Dipodium pulchellum* A, flower from front x 1. B, flower from side x 1. C, labellum from above x 1.5 D, labellum callus x 2.5.

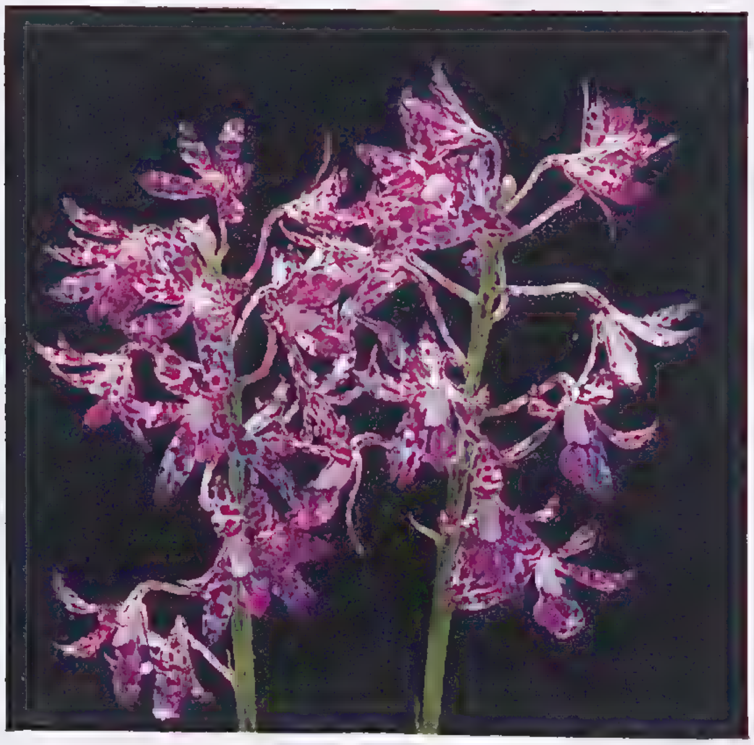
The following colour plates did not appear in the original article by David Jones and Mark Clements. The colour slides have been supplied by Lex Barton and are included here as an aid in the identification of these new species and combinations - Editor.



Chiloglotis sylvestris D. Jones et M. Clements
side view. Photo by David Jones.

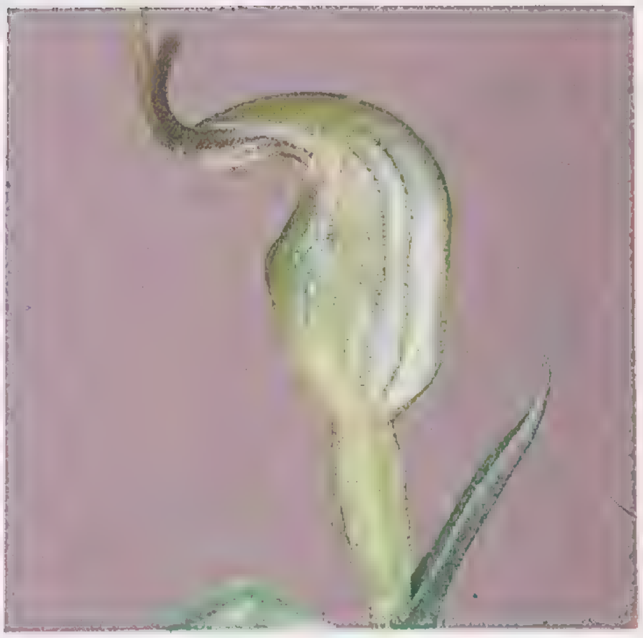


Dipodium pulchellum D. Jones et M. Clements
Photo by Lex Barton.

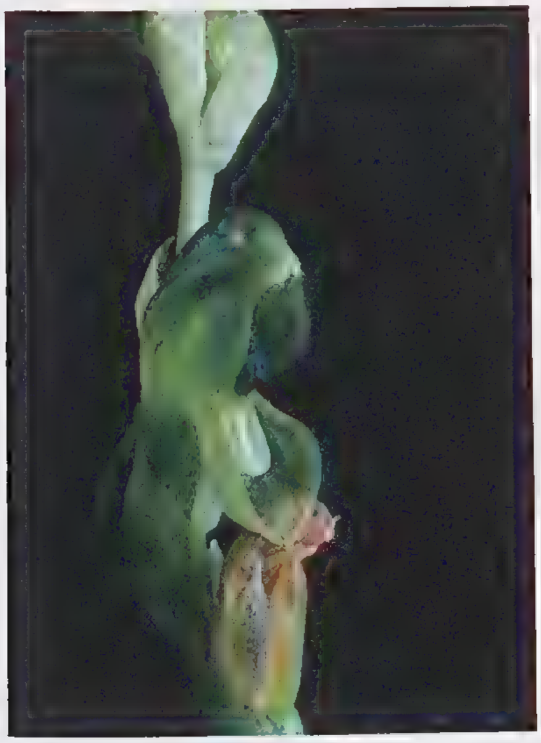


Dipodium variegatum M. Clements et D. Jones
Photo by Lex Barton.

Pterostylis bicornis D. Jones et M. Clements
in situ at Mt. Maroon. Photo David Jones.



Pterostylis bicornis D. Jones et M. Clements
side view. Photo David Jones.



Pterostylis bicolor M. Clements et D. Jones
Photo Lex Barton.

Collections Examined: Acacia Creek, McPherson Range, Jan. 1907, W. Down s.n. (NSW); Tamborine Mt, May 1925, H. Curtis s.n. (NSW); Mt Superbus, via Warwick, 20 Jan. 1965, R. Deering 070897 (BRI); The Summit, 21 Dec. 1961, W.W. Abell 070893 (BRI).

Habitat: Open forest, usually on soils of basalt origin.

Flowering Period: December-May.

Affinities: *D. pulchellum* has obvious affinities with *D. punctatum* but can be recognised by its deep rose-pink flowers which are heavily blotched. Unlike *D. punctatum* its perianth segments do not reflex or recurve. Its labellum callus is of a very different shape to that of *D. punctatum*, the keels being linear, somewhat clavate and diverging towards the end.

Conservation Status: This species is probably more widespread than is presently known. Its conservation status is suggested as 3R following criteria of Leigh, Briggs and Hartley (1981).

Etymology: The specific epithet is derived from the beautiful coloration of the flowers.

Diuris chrysantha D. Jones et M. Clements **sp. nov.** affinis *D. aureae* Smith sed floribus multo parvioribus, petali orbicularibus vel rotundi in unque prominenti insertis, sepalis lateralibus lineare-spathulatis differt.

Typus: Queensland, hill about 4 km north-west of Stanthorpe, 3 Nov. 1985, D. L. Jones 2188 (BRI, holo; CBG, iso).

Tubers to 30 mm x 15 mm, obovoid, entire or bifid, brown, fleshy. Leaves 1 or 2, basal, 12-36 cm x 4-8 mm, linear-subulate, conduplicate. Inflorescence 15-32 cm tall, slender, with 1 or 2 closely ensheathing, lanceolate, sterile bracts. Flowers 2-7, about 25 mm long, golden yellow to orange, with brown markings on the dorsal sepal and labellum. Dorsal sepal 7-9 mm x 6-7 mm, ovate, erect in the distal half, with two dark brown blotches prominent in the centre. Lateral sepals 12-18 mm x 2-4 mm, linear-spathulate, parallel or crossed, green and brown, the tips often curved forwards. Petals obliquely erect or recurved, unmarked; lamina 6-8 mm x 6-8 mm, orbicular to obcordate; claw 4-7 mm long, brown, widening into the lamina. Labellum 7-9 mm long, projected forwards at an oblique downwards angle, with prominent brown markings, three-lobed; lateral-lobes 2.5-4 mm x 2.5-3 mm, narrow ovate to obovate, erect, distal margins entire or crenulate; mid-lobe cuneate in basal half then expended into a cordate to reniform lamina 6.5-8 mm across when flattened, usually conduplicate. Labellum callus confined to basal half of mid-lobe, consisting of two, thick, divergent ridges incurved in the distal part. Column 3.5-4 mm long. Anther about 4 mm x 1.5 mm, brown. Pollinia 4, about 2.5 mm x 0.8 mm, white, attached to a viscidium about 1 mm across. Stigma about 2 mm x 2.5 mm, cordate. Column wings about 4 mm x 1 mm, linear, irregularly crenulate. Fig. 7A-D.

Distribution: South-eastern Queensland (Moreton, Darling Downs and Wide Bay districts) and northern New South Wales (northern tablelands).

Habitat: Open forest and woodland.

Flowering Period: August to November.

Affinities: *D. chrysantha* is a very common orchid of south-eastern Queensland that has been confused with *D. aurea*. It has affinities with that species but can be distinguished by its much smaller flowers, rounded petal laminae, two prominent dark spots on the dorsal sepal and the lateral sepals being broadest near the apex.

Conservation Status: This widespread, common species is well conserved in National Parks.

Etymology: The specific epithet refers to the golden-yellow coloration of the flowers.

New Combination

Diuris punctata sens. lat. is a complex of taxa that has been under close examination by us over a number of years. It will be the subject of a comprehensive paper (by the senior author) in preparation for the treatment of these taxa in the forthcoming Volume 47 of the Flora of Australia. Research has shown that *D. punctata* var. *parvipetala* is morphologically distinct from *D. punctata* and is here raised to specific rank.

Diuris parvipetala (Dockr.) D. Jones and M. Clements **comb. et stat. nov.**

Basionym: *D. punctata* var. *parvipetala* Dockr., Victorian Naturalist 81: 137 (1964): **Typus:** Brigooda via Proston, Qld, W. Power, Sept. 1954 (BRI, holo).

Distribution: South-eastern Queensland (Darling Downs and Burnett).

Habitat: Open forest.

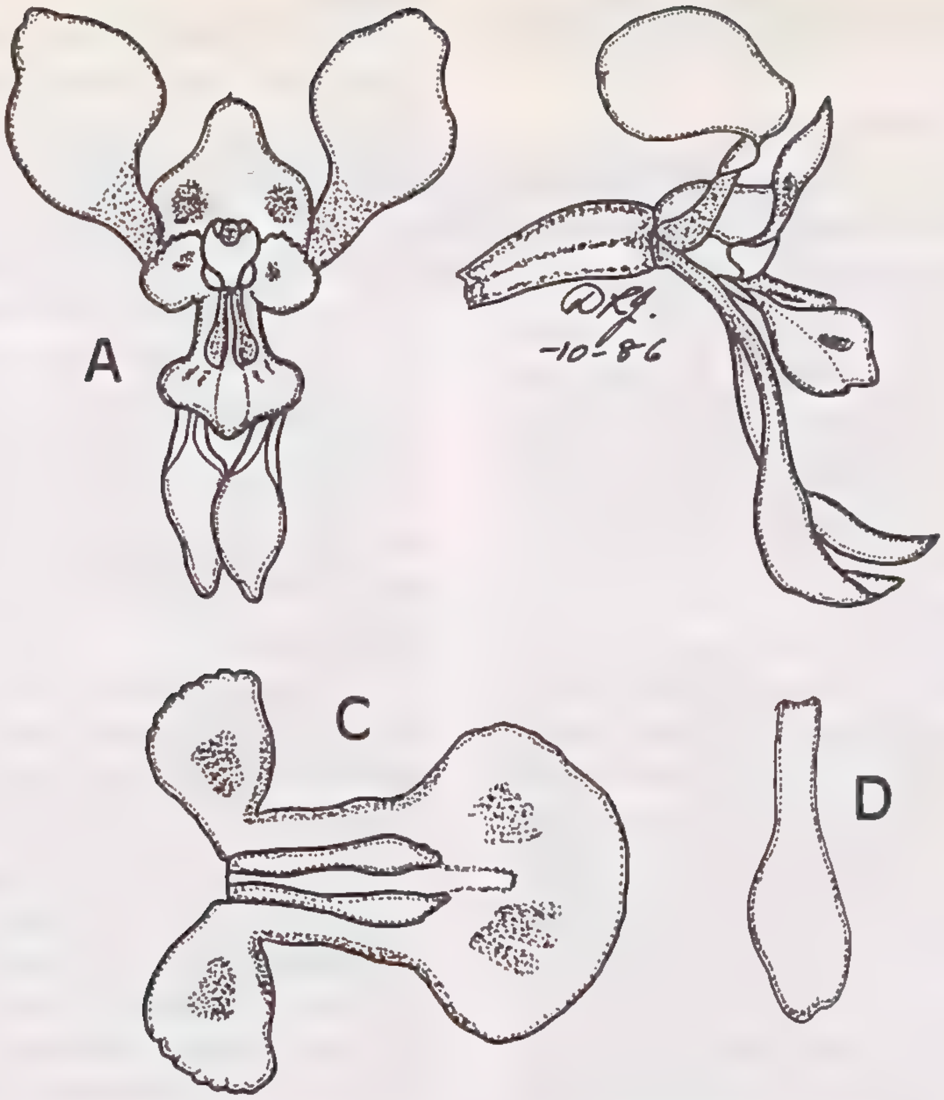


Figure 7. *Diuris chrysantha* A, flower from front x 1. B, flower from side x 1. C, labellum flattened out x 2. D, lateral sepal flattened x 1.

Flowering Period: August and September.

Conservation Status: Uncertain, probably 3K by criteria of Leigh, Briggs and Hartley (1981).

Affinities: *D. parvipetala* has a number of significant differences from *D. punctata* Smith sens. str. namely much smaller flowers but with relatively very long lateral sepals, very small, wedge-shaped petals with the lamina tapering into the basal claw and the labellum mid-lobe tapering to the base and not contracting abruptly as it does in *D. punctata.*

Acknowledgements

The authors wish to thank Les Pedley, Queensland Herbarium for furnishing six Latin diagnoses and Michael Crisp, Australian National Botanic Gardens, the remaining one; Jim Armstrong, Australian National Botanic Gardens for criticism of the draft; Bob Johnson, Queensland Herbarium for providing access to material at BRI; Lex Barton and Derek Hine for collecting specimens and Barbara Jones for processing the manuscript. The work of D.L. Jones was partly funded by a grant from the Australian Biological Resources Study. In addition, this manuscript was, in part, prepared at the Australian National Botanic Gardens on equipment supplied by the Nell and Hermon Slade Trust and the Australian Orchid Foundation; for their assistance we are most grateful.

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READER'S FORUM

A Question of Parentage II

Peter Vaughan
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I agree with M. McTiernan (Orchadian March 1987 p.242) that the names for our hybrid orchids are getting out of hand. It seems ridiculous that plants with identical parents should have different names. Unfortunately it is too late for us to change the system though I believe there is a better system. Prof. R.E. Holttum fought for it many years ago and lost; time has proved him right.

Prof. Holttum's System

Prof. Holttum proposes that a hybrid name should signify a certain assemblage of parents, irrespective of their parentage. For example, all offspring from *Dendrobium speciosum* and *Den. kingianum* are *Den.* X *delicatum*. If you back cross *Den.* X *delicatum* to either parent, Holttum proposes that the result is still *Den.* X *delicatum*. If you crossed it with *Den. falcorostrum* you have *Den.* Delicate Falcon. You would have the same name if *Den.* Andrew Persson (*Den. speciosum* x *Den. falcorostrum*) had been used, i.e. all the progeny of *Den. speciosum*, *Den. kingianum* and *Den. falcorostrum* are *Den.* Gracious Falcon. If we look at these crosses objectively, the concentration of the parents is not that important. What is important is the quality of the parents, especially where the parents are themselves hybrids. If one parent does dominate, e.g. in a *Den.* Jane Leaney (*Den.* X *delicatum* x *Den. speciosum*) that is very *Den. speciosum* like, the alternative label could be *Den.* X *delicatum* (*Den. speciosum* 75%). I have used simple hybrids to describe the system. Its real advantage is where there are dozens of names for hybrids involving only 2 or 3 species. Examples of these are with *Den. bigibbum* x *Den. phalaenopsis* (still different species for registration purposes) hybrids and to a lesser extent *Den. bigibbum* x *Den. discolor*.

A system such as this would reduce the number of hybrid names to a fraction of the present. In doing so, most of us will readily comprehend the parentage. Admittedly the present system offers more information, but if is of no value if the information is not able to be recalled when required.

Clone Names

Clone names should be used more often; *Den.* Aussie Zest could be of dubious quality if we were offered a plant at a show. It helps to know who the hybridizer was, but few hybridizers retail widely. If the parents were *Den.* Eureka 'Top Notch' and *Den.* Aussie Starlight 'Gold' we would probably kill for the plant. Therefore I am wishing to add a third name to our hybrids, i.e. the clone title. You may now say I am complicating matters by adding potentially thousands of clone names. The advantage of a clone name is that once it is no longer used, it can be forgotten. If you forget with *Den.* Black Mickey Mouse is, it makes future hybrids in that line absolutely meaningless; at least with Holttum's system, the basic information is there.

Summation

We are getting to the stage where we cannot keep track of our native orchid hybrids in a simple manner. Many hybrid names are being forgotten as are the hybrids. We cannot afford to forget the early names as they are needed to add meaning to the present hybrids. The result will be the meaningless jumble of names we see with cymbidiums, etc. We could retain meaning to hybrid names by following an alternative system recommended by Holttum. Unfortunately it is too late to do so (it may also be opposed by a small group of enthusiasts who have no trouble with the names at this stage).

Reference

Holttum, R.E. 1978. Some thoughts on orchid taxonomy in relation to horticulture with special reference to *Dendrobium*. In: Proceedings of the Symposium on Orchidology, Singapore, 1978. Stamford College Press, Singapore.

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GOVERNOR HAHL'S *BULBOPHYLLUM*

N.H.S. Howcroft

One of the first *Bulbophyllum* species, and among the first orchids I illustrated in Papua New Guinea, was in a private collection held on the forestry station at Keravat in East New Britain. It was a fresh local collection which I remember clearly, as it had large glossy flowers with a strong pleasant perfume, and I was to find later that I had incorrectly illustrated the flower in the resupinate position.

Over a number of years since then I have collected this orchid on the coasts and islands of Papua New Guinea, particularly in New Britain. This clearly distinctive orchid I identified with Schlechter's *Bulbophyllum hahlianum* which he named in honour of Dr. Albert Hahl (1868-1945).

Hahl, at the age of twenty-eight, was appointed Imperial Judge at Herbertshohe, now known as Kokopo, in East New Britain. He spent three years in this position and then, between July 1899 and June 1901, was first appointed deputy and then acting governor of German New Guinea, with his seat of administration for a time located at Ponape in the Caroline Islands. After returning for a short period to Germany for health reasons, he was appointed, on the 20th November 1902, as Governor of German New Guinea for a term cut short by World War I (Gash and Whittaker 1975).

Governor Hahl's *Bulbophyllum* was discovered on trees in a beach swamp on New Britain between Massawa and Cape Lambert in November 1901 and it was formerly described and named in his honour in 1905.

Description

Bulbophyllum hahlianum Schltr. in K. Schum. et Laut., Nachtr. (1 905), 204; *B. macranthum* Lindley var. *albescens* J.J. Smith in Orch. Ambon (1905), 81.

Epiphytic orchid; rhizomes creeping, thickly covered with roots and dried bristles and bracts or mucous-covered bracts. **Pseudobulbs** ovoid-oblong, 3-5 cm long, 1-2 cm wide, unifoliate. **Leaf** erect, oblong to oblong-elliptic, obtuse, narrowed at base, leathery, stiff, 15-35 cm long, 5-9 cm wide (Fig. 1A). **Inflorescence** 1-flowered, peduncle arising from rhizome, circa 8 cm long with pedicel and ovary (Fig. 1A). **Flower** nonresupinate, tepals with glossy surface, circa 5.5 cm wide. **Dorsal sepal** obovate-oblong, more or less concave, erect (Fig. 1B). **Lateral sepals** obliquely obovate-oblong to broadly falcate, as long as dorsal sepal and slightly wider, free at base, united towards the front (Figs. 1A, 1D). **Petals** oblong-spathulate, margins near apex nearly always folded, obtuse, 20-25 x 7-8 mm (Fig. 1C). **Labellum** small, mobile, 4-5 mm (Figs. 1E, F), at the base more or less 5-6 angled (Fig. 1G), distal portion spur shaped, laterally compressed to a keel on the ventral part (Figs. 1E, F) and hanging through the cleft between the lateral sepals (Fig. 1A; left flower). **Tepals** glossy, yellowish with red-brown longitudinal veins; **labellum** yellow and brown. **Column** almost straight, lower margins forming blunted stelids; column foot slightly less than 90 degrees angle to column, curved (Fig. 1H). **Anther** more or less quadrate, hood shaped with a blunt, somewhat laterally compressed umbo at apex (Figs. 1J, I). **Pollinia** in two pairs. **Stigma** moderately large. **Ovary** and pedicel glabrous, light yellow.

Distribution

Judging from live collections, this species abounds mainly along the coastline of the northern shores of Papua New Guinea and on the adjacent islands of the Bismark Archipelago. It has been collected in Irian Jaya from the Lorentz River, and Humbolt Bay areas as well as from Ambon. (Smith 1916). The specimen illustrated here was collected from a *Calophyllum* tree on a small island at the mouth of the Isis River on the south coast of New Britain, close to Pomio.

Habitat

Coastal and beach forests, in either direct sunlight or shade. Plants on the beach may sometimes be exposed to salt spray. Most collection areas are known to have high rainfall. It is not known if the range of this species in Papua New Guinea extends beyond the coastal forests.

Cultivation

The species is not difficult to grow here at Bulolo (alt. 700 m. a.s.1.; rainfall 1,600 mm/annum) and it takes readily to tree fern slabs, hardwood slabs, dried coconut husks and live trees such as *Calliandra* which I use as a common support for other species of this section. This year at Bulolo has been the driest on record since 1933, but this species and its relatives have survived quite well

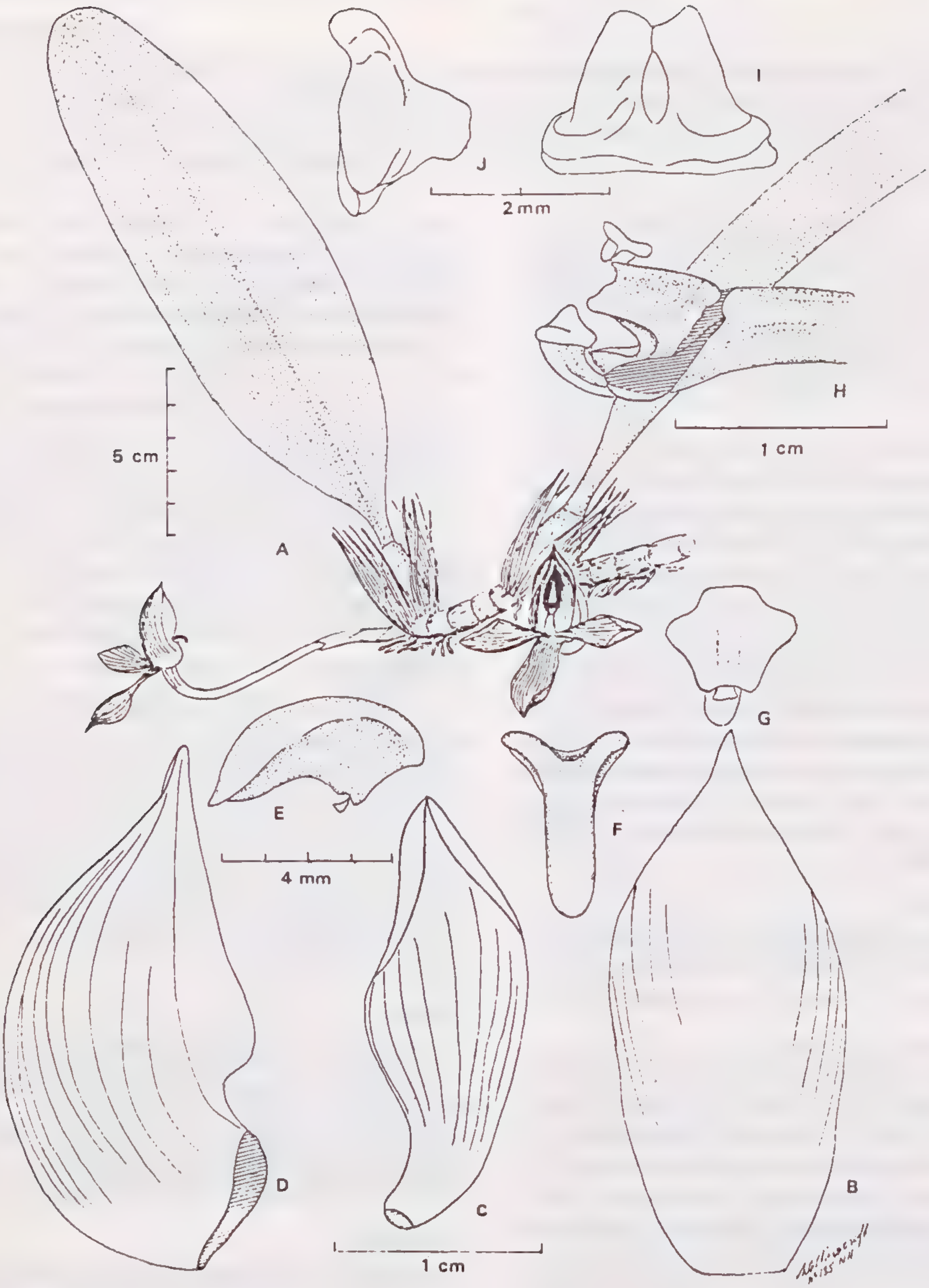

Figure 1. *Bulbophyllum hahlianum* A, plant. B, dorsal sepal. C, petal. D, lateral sepal. E, labellum from side. F, labellum. G, labellum base. H, column. I and J, anther.

compared to other coastal genera and this gives one a good impression of their toughness.

Flowering

Flowers are produced several times a year, particularly around January and September. The flowers emit a pleasant perfume produced from the tepals. This perfume can be noticed if either petals or sepals are stripped off and carried around in the hand. The perfume attracts several species of fruit fly of the genus *Dacus* which have been observed to pollinate this species and its relatives.

Conservation Requirements

The species is abundant over it's known range and it cannot be considered rare. It is not threatened in any part of its known range in Papua New Guinea even in spite of some destruction by logging. No conservation measures are required for this species.

Notes

B. hahlianum belongs to the section *Stenochilus* J.J. Smith of which eleven are known from Papua New Guinea (Howcroft 1983). This number is likely to be altered as the Australian species *B. baileyi* F. Muell. is known to occur in Papua New Guinea (Millar 1978) and this species may prove to be synonymous with *B. caryophyllum* J.J.Sm. In addition, another species previously known from the Philippines will be added to the list in the near future.

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AUSTRALIAN NATIVE ORCHID HYBRIDS

(New registrations by the R.H.S. from lists in the Orchid Review, Nov. — Dec., 1987.)

NAME	PARENTAGE	REGISTERED BY
Dendrobium		
Aussie Gift	Aussie Ira x Hastings	P. Spence
Aussie Sandy	Specio-kingianum x Aussie Mist	P. Spence
Dot Sheen	Ellen x Aussie Bonanza	S. Batchelor
Ellen Grace	*gracilicaule* x Ellen	R. & D. Sheen
Graeme Banks	Sunglow x Hilda Poxon	D. Banks
Manning	*speciosum* x Willowie Gold	Merrellen
Whispering Jack	Golden Fleck x Peter	D. Banks
Winston Hills	Kevin Banks x *tetragonum*	D. Banks

CULTIVATING AUSTRALIAN NATIVE ORCHIDS

John Hazelwood

When one considers the culture of Australian native orchids, I believe that you should take a long hard look (make that two or three) at their native environment. What I mean by a long hard look is that you not only take a look and say, "Ah! That *Dendrobium kingianum* is growing on a rock", and that is that, but think what the rock is providing for the plant other than a place to live with a view across the creek.

Housing

In areas south of Rockhampton, species other than some native to the coastal lowlands of north Queensland, will grow quite satisfactorily in a bushhouse with 50% shade. Mini environments can be created for species such as *Sarcochilus fitzgeraldii* by providing an area more shade. This can be achieved by hanging plants that require more light above the bench selected for growing the plants that require less light. In my bushhouse, I have used orchids, ferns, and Old Man's Beard to blot out that extra unwanted light.

The floor of the bushhouse should be covered with a medium that will retain moisture and allow the natural process of evaporation to keep a high humidity in the bushhouse. Materials such as ashes, coarse sand, gravel, and saw dust have all been used with success. Where it is considered that a plant or group of plants will require more humidity, a shallow trap can be placed on the floor under the plants and kept full of water.

Getting back to that *Dendrobium kingianum* growing on the rock looking over the creek, we can now see that the plant is there because it is getting the right amount of light, good air movement, and is benefiting from the humidity gained by evaporation from the creek.

Potting and Slab Mounts

The thing to remember is that orchids grow **ON NOT IN** their medium; they use their host to secure a position where they can get the amount of light and air movement they require. When selecting a pot to use, make sure it is not too large; do not over-pot but still allow enough room for several years growth.

Pots can be either clay or plastic so long as they provide good drainage. When using plastic pots, I would suggest that you start repotting by half-filling the pot with granulated polystyrene foam before adding the selected potting mixture. With clay pots, I fill the first third of the pot with granulated polystyrene foam. By placing the granulated polystyrene foam in the bottom of the pot you not only ensure good drainage but also stabilise root temperature.

Over the years, many different potting mixes have been used successfully. Some work for one person and not for other people, so by experimenting carefully you will soon be able to find the one that suits your conditions. Potting mixes can contain 3/4" grade blue metal gravel, coarse sand, bark collected from the mountain oak (*Casuarina* species), American fir bark, and Australian pine bark. The combination that I prefer is one part granulated polystyrene foam, one part bark (any of the above mentioned barks), and a clay pot.

Slab Mounts: Materials used for slab mounts include weathered hardwood, natural cork, conglomerate cork board, polystyrene foam coated with peat, and terracotta tiles. All these materials can be used successfully and all provide excellent drainage. However, you will find that mounts of conglomerate cork board will break down quickest. For some years I have been experimenting by sewing up shadecloth socks and filling them with a mix of one part granulated polystyrene foam and one part medium bark. To date, this method has been working well for me.

Water

During winter, I water once a week in the morning so that the plants dry off before nightfall. In summer, I water approximately three times a week, and on very hot days I find that a light misting in the middle of the day is beneficial to the good health of the plants — sometimes you can almost hear them saying "Thank you".

Fertilizing

During the warmer growing season, I fertilize about once a week with fertilizer high in nitrogen. In late summer and autumn, I use fertilizer high in phosphorus. I find that using from half to three-quarter the recommended strength is best. In winter, I fertilize about every three weeks. Avoid applying fertilizer during the heat of the day as it can often scald or burn the plants. Furthermore, I always water the plants before fertilizing.

Conclusion

Once again I would like to mention that plant of *Dendrobium kingianum* growing on the rock overlooking the creek. When I thing about it, I see that not only is the rock position providing correct light intensity, air movement, and humidity, but also good drainage, and water movement across the rock surface is bringing all forms of nutrient to the plant. A covering of leaf mould is keeping the roots cool and preventing excessive loss of moisture. Finally, the rock itself stores heat during the day and slowly looses heat during the night, which means that changes in root temperature are slow; even when the air temperature drops rapidly by 10 °C, the roots will still have that stored heat radiating from the rock. It is because of that last deduction that I began using pots half filled with granulated polystyrene foam some five or six years ago. I have found that the roots of the plants grow better in these pots; the bottom half being filled with a solid mass of clean healthy white roots.

REPORT FROM THE IRA BUTLER TROPHY COMMITTEE, 1987

This year entries were received from the following Societies and ANOS Groups: —

ANOS Sydney

Autumn Show — R. Wheeldon – (*Dendrobium bigibbum* var. *compactum* x *Dendrobium* Tangerine)
Spring Show — R. Wheeldon – *Sarcochilus* Weinhart
Sarcanthanae Show — S. Batchelor – *Sarcochilus* Melba

ANOS Warringah

Spring Show — T. Carter – *Pterostylis* Cutie 'Harold's Pride'

ANOS Far North Coast

Spring Show — D. Lynch – *Dendrobium* Lynette Banks

Wollongong & District NOS

Spring Show — R. Wheeldon – *Sarcochilus* Weinhart

NOSSA

Spring Show — Mrs. M. Fuller – *Dendrobium* Bardo Rose 'Pink Delight'

OSNSW

Winter Show — B.J. Fletcher – (*Dendrobium* Sunglow x *Dendrobium* Hilda Poxon) 'Evelyn'
Spring Show — G. Errington – *Sarconopsis* Lavinia 'Dorothy'

North Moreton, Qld. OC

Winter Charity Show — M. & J. Rivers – *Dendrobium* Gloucester Sands

Orchid Society of WA

Winter Show — Mrs. L. Rowe – *Dendrobium* Hilda Poxon
Spring Show — J. Fleming – *Dendrobium* X *delicatum*

Orchid Club of SA

Winter Show — R. & P. Rankin – *Dendrobium* Aussie Child
Spring Show — Hills Family – *Dendrobium* Aussie Bonanza

Tasmanian OS

Spring Show — M. Mitchell – *Dendrobium* Bardo Rose

Champion Australian Native Orchid Hybrid 1987

Sarcochilus Melba — owned by Sid Batchelor

This was a beautifully grown plant, presenting several scapes of well presented, fresh, crystalline flowers measuring 32 mm across. The overall beauty of this plant demonstrates the perfection that is being sought and accomplished in our native hybrids.

Ruth Radkin, Hon. Secretaty, on behalf of the Committee.

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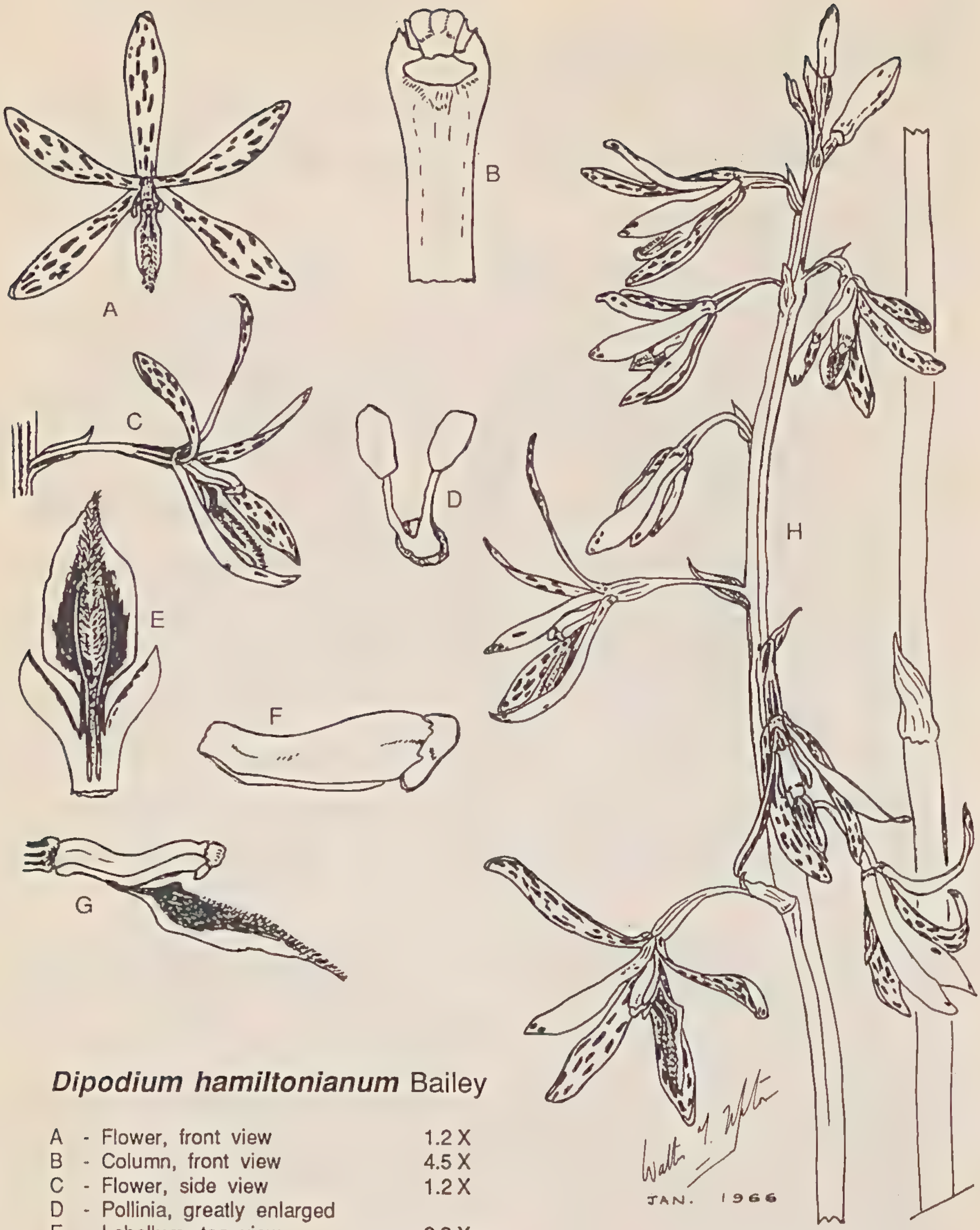

Dipodium hamiltonianum Bailey

A	- Flower, front view	1.2 X
B	- Column, front view	4.5 X
C	- Flower, side view	1.2 X
D	- Pollinia, greatly enlarged	
E	- Labellum, top view	2.3 X
F	- Column, side view	4.5 X
G	- Column & Labellum, side view	2.3 X
H	- Plant	1.2 X

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Oberonia palmicola F. Muell.

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EDITORIAL

W.H. (Bill) Murdoch is a name know well by many native orchid enthusiasts. It is therefore fitting that this issue should contain an article about the presentation to Bill Murdoch of the Award of Honour from the Australian Orchid Foundation. A little of Bill's life history and his role in the formation of ANOS is included. His many friends in ANOS and other orchid groups would join with me, I am sure, in congratulating Bill on this prestigious award and wishing him a long, happy, and healthy 'retirement'.

Conservation of our native orchid species is a matter of concern for all serious enthusiasts of native orchids. ANOS Council has a Conservation Subcommittee which is putting together the ANOS Conservation Policy Statement. Many ANOS Groups and Affiliated Societies are actively involved at the local level and some groups have had a deal of success. In this issue of The Orchadian, Max Gibbs describes a unique reserve set up within an exotic pine plantation at Iwitahi, New Zealand.

However, Max did not include in his article the full story of how a band of native orchid enthusiasts convinced the owners of the pine plantation to set aside an area where the native orchids could be preserved. I found the full story in the December, 1987, issue of the NZNOG Newsletter, and I will quote Max Gibbs in the hope that others might be stimulated to achieve similar action in their areas.

"During our native orchid field days last year, it was suggested that an approach be made to Forestry Corp. with the view to conserving or preserving part of the native orchid habitat at Iwitahi. ..... I met Mark Strong and Glen Johnston from Timberlands, BOP at Iwitahi to see what could be done. I had previously sent them a map marking the exact locations we were interested in conserving. ...... We were able to show Mark and Glen the emerging orchids in several of the areas and they had a keen sense of conservation and appreciation of the problem. After some discussion they made us a very generous offer which we accepted on behalf of the Taupo Orchid Society and the Native Orchid Group.

1. The area presently being logged will be left until the orchids are mature enough to locate and transplant to places like the Botanical Gardens. The area will then be logged, burnt and replanted with Pinus radiata *which will be managed .... to encourage the reestablishment of orchids from the central block.*

2. The central block will not be logged but will be given a reserve status .... The block will be managed to extend its life ....

3. The use of sprays will be banned on the roadside area adjacent to the camp to protect the native orchid Calochilus robertsonii."

Congratulations Max Gibbs and your friends of the Taupo Orchid Society. And thank you Timberlands BOP for your foresight and cooperation; future generations now have an area where a unique collection of native orchids can grow and thrive to be enjoyed by all.

I am sure there are similar stories of success in conservation of our unique native orchids. I know of the Cristata Compound near Salmon Gums, WA, of the R.S. Rogers Terrestrial Orchid House in the Adelaide Botanic Gardens, SA, of the large collection of living orchid plants at the National Botanic Gardens, Canberra, and of similar collections on the Gold Coast in Queensland and at the Blackbutt Reserve near Newcastle, NSW. And there must be others. Their establishment and progress would make an interesting story and would provide an example for others to follow.

The Newsletters of the ANOS Groups and Associated Societies often contain useful hints on how to grow native orchids. While some of the cultural advice has been developed to take local environmental conditions into account, there is usually information which may be of benefit to growers in other areas. In the hope that you might find that elusive 'something' which helps you grow your orchids better, I have gleaned **Growing Tips** *on* Cymbidium canaliculatum, Sarcochilus *Southern Cross*, Sarcochilus fitzgeraldii, *and the genus* Sarcochilus.

Noel J. Grundon

FROM THE BACK OF THE BUSHHOUSE

by Brian Molloy

This issue takes us across the Tasman to the 'Land of the Long White Cloud' – New Zealand. Brian Molloy who is a Research Botanist in the New Zealand Department of Scientific and Industrial Research tells us a little about himself and his activities, and much about the activities of many enthusiastic growers of Australasian native orchids — Editor.

***Tena Koutou Katoa* – Greetings everyone!**

As your New Zealand Editorial Associate it is my pleasant task to contribute to this column of orchid news and views. My contribution this time will be slanted more to news rather than views. The latter may come later should the Bushhouse remain intact.

Firstly, I am pleased to report that interest in native orchids in New Zealand is growing all the time, with enthusiasts popping up in all sorts of places from North Cape to Bluff, as we say in this country. Many belong to regional orchid societies whose meetings and shows often feature native orchids. At the Second New Zealand International Orchid Conference in 1985 practically every regional exhibit included a sprinkling of native orchids. In addition, a special display of native orchids attracted very favourable comment.

Much credit for stimulating a renewed interest in native orchids must go to Dorothy Cooper who initiated the New Zealand Native Orchid Group (NZNOG) some five years ago, and was the first editor of the group's Newsletter. Dorothy will be well known to Orchadian readers for her past articles on New Zealand native orchids. From modest beginnings (cyclostyled) the Newsletter is evolving into a valuable record of native orchid lore and information, somewhat paralleling the early days of the Orchadian post 1963. The current editor, Dr Ian St George, is continuing the good work and successfully eliciting local notes and a range of other orchid articles. Ian is also spearheading an orchid mapping scheme with some financial support from the New Zealand Lottery Board.

Other worthy projects are in the pipeline. As at June 1987, membership of the NZNOG approached 120 and includes a grand mixture of people. Such is the lure and attraction of native orchids.

I can also report that some of the familiar "names" of the native orchid scene, especially Dan Hatch, that fine orchid artist Bruce Irwin, and my former teacher Dr Ella Campbell, are still very active and in constant demand because of their knowledge and experience. There is an expanding network of other skilled and competent enthusiasts too numerous for me to list individually.

An exciting recent development is the regional field day, excursion, forum, call it what you will, where enthusiasts can enjoy the pleasure of native orchids in the wild and generally swap notes and experiences. I was privileged to join such a forum recently in Northland, that veritable oasis of native orchids, thanks to a generous grant from the Canterbury Orchid Society and my hosts, Doug and Chris McCrae of the Kaitaia Orchid Society. More recently another highly successful field forum was organised in central North island by the Taupo Orchid Society. Similar excursions are mooted for other regions, and perhaps the day is not far off when reciprocal trans-Tasman field excursions will come to pass. I would like to think that ANOS might take this up as a worthwhile initiative.

One of my functions for ANOS is to help publicise its activities and overall objectives among New Zealand's orchid community. To this end appropriate articles, based on material supplied by ANOS, have recently appeared in the NZNOG Newsletter, the Newsletter of the New Zealand Botanical Society, and Orchids in New Zealand, the official journal of the New Zealand Orchid Society and the Orchid Council of New Zealand. Another thrust is to promote the affiliation of the NZNOG with ANOS. Apart from a few dissenting voices, there seems to be strong support for this move and the necessary wheels have now been set in motion.

An even more important role for me is to encourage more New Zealand native orchid enthusiasts to subscribe to the Orchadian and to submit articles in line with the new-look approach of the journal. It is, after all, "Australasian" by name and intent. One such article by Max Gibbs of the Taupo Orchid Society backgrounds a unique orchid reserve among exotic pines at Iwatahi in central North Island. This particular area of plantation forest, like some others in New Zealand, abounds with native orchids, no doubt flourishing in the super-rich fungal environment. Max and his team have successfully persuaded New Zealand Timberlands Ltd, a new commercial offshoot of the former New Zealand Forest Service to establish this reserve which is the first of its kind in the country, if not in Australasia. I hope that Max's readable article will be the forerunner of others to emanate from New Zealand in the future, especially since we share so many orchids across the Tasman.

For my own part I will be channelling much of my research work on orchids to the Orchadian. At present good progress is being maintained on a checklist of New Zealand native orchids with co-authors Dan Hatch and Mark Clements. This project was given added impetus by my visit to Australia last year, supported by a substantial grant from the New Zealand Orchid Foundation Trust Board.

In conclusion, I can only repeat that interest in native orchids in New Zealand is gathering momentum every day. The future in all fields is exciting and the prospects of greater communication with our Australasian counterparts look exceedingly bright. Let us all champion the common cause – orchids are for everyone.

IWITAHI: A NATIVE ORCHID RESERVE IN EXOTIC PINE FOREST, NEW ZEALAND.

by Max M. Gibbs

15 Rahui Street, Taupo, New Zealand

During the Depression of the 1930s, large areas of the central volcanic plateau of the North Island of New Zealand were cleared of scrub and planted with several species of pine. Over the last decade these plantations have formed the heart of New Zealand's exotic timber industry, but today only a fraction of the original plantings will stand as the forest industry logs, clear-burns, and replants large areas each year. Iwitahi, 40 km east of Taupo, has some of the last stands of *Pinus nigra* planted in 1933. Because of their age and growth habit, these trees have developed a high canopy, leaving the forest floor open and almost devoid of low branches. Over maturity and attacks of the needle caste fungus, *Dothistroma*, have caused the canopy to open and allow more light to reach the forest floor as well as build up a thick mat of pine needles. In contrast with the dense undergrowth in the adjacent *P. ponderosa* forests, there is a virtual absence of undergrowth beneath the *P. nigra* at Iwitahi and this is limited to occasional clumps of low ferns.

On first entering the forest, it appears to be a bleak and empty place because of the low light and still air. Then you realise you are standing on a carpet of native orchids. Surprise turns to wonder as the extent of the orchids becomes apparent. The carpet is almost continuous as far as you can see. *Chiloglottis cornuta* is dotted in clumps of up to 10 plants but frequently increasing in density to 50-100 plants per square metre throughout the area. It is early December and *C. cornuta* is in full bloom but it is not alone. A myriad of tiny white stars announce the presence of *Adenochilus gracilis* in similar numbers, and patches of green amid the brown of the pine needles mark colonies of *Corybas trilobus* with several hundred plants per square metre.

The almost flat terrain is broken by shallow mossy humps and depressions where dense colonies of *Aporostylis bifolia* grow. On the steep sides of deeper depressions, *C. trilobus* plants form green staircases leading up to small colonies of *Thelymitra decora* and the occasional group of an unnamed *Pterostylis*.

Blending in with the sea of *Adenochilus* flowers, *Caladenia lyallii* is almost hidden and not easy to find, although it is quite common throughout the area. *Caladenia iridescens* is much less common and isolated groups of these tall orchids with their jewel-like flowers are found in the darker areas. Another *Caladenia* also grows near *C. iridescens.* It is a tall pink form of *C. catenata* which grows as isolated plants and is about twice as tall as the more common greenish form found in the brighter areas near the edge of the forest.

The occasional fallen tree provides a microclimate with still air close to the decaying trunk on the forest floor. Here dense colonies of single orchid species have developed. In one such zone is a colony of *Chiloglottis gunnii* with several hundred plants in various stages of flowering. This is the first and only record of *C. gunnii* in the North Island of New Zealand (Molloy and Johns 1983). Several patches of *Corybas macranthus* have also found these microclimates to their liking. At first glance there appear to be only leaves as the flowers have developed below the top layer of pine needles and their dark red colour blends with the shadows and the dark brown humus. *Chiloglottis cornuta* also favours areas around fallen logs and is even found growing in cracks in the bark and in the decaying sap layer of the tree stumps.

Like sentries on guard duty, *Pterostylis cardiostigma* stand widely spaced with their filaments held erect. In contrast, *P. patens* huddles together in groups of 50-60 plants, so close that their curled filaments tangle. A recent wind storm has caused a lot of small branches and twigs to fall and the latter have arrowed into the pine needles creating a vertical forest of spikes up to 30 cm tall. Against this background, it is difficult to spot plants of *Gastrodia*, but there in a hollow at the base of a tree are the characteristic dark purple-brown spikes of several *G. cunninghamii* plants carrying 20-30 buds on each stem. Last year's dry stems of *G. minor*, complete with the dried husks of seed pods, are also present but the newly emerging plants are not easy to see. Like bent hair pins, and not much bigger, *G. minor* plants thrust their tiny spikes through the mat of pine needles before unfolding to hold 3 or 4 flowers 10-15 cm above the ground.

The *Pinus nigra* forest at Iwitahi covers an area of several square kilometers and is broken by a grid of dirt access roads and fire breaks. In all of these forest blocks, the density of native orchids appears to increase towards the edges where the species composition changes to favour the sun-loving orchids. *Microtis unifolia* is thick amongst the road-side grasses and large areas *Thelymitra longifolia* and pink and blue *T. pauciflora* have taken over the grass free sun baked banks. Less common are *Microtis parviflora* and *Prasophyllum colensoi*, but both can be found in the short grass along the road-side. A grass free area beneath some tall gum trees (*Eucalyptus*) is the home of a colony of *Calochilus robertsonii* with their purple-blue beards glistening in the sun. The colony of several hundred plants is spread along both sides of the road but stops where there is competition from grass. Some *C. robertsonii* plants were also found under the *P. nigra* in areas where several trees had fallen, allowing more sunlight to reach the forest floor.

The pattern of distribution of the native orchids at Iwitahi suggests that the forest has become a natural trap for windborne orchid seed, and the lack of competing flora on a forest floor covered with fungal-rich acid compost has allowed them to become established. For example, the colony of *C. gunnii* is within 20 metres of a road and is probably derived from a single seed reaching the area. Highest densities of most of the orchid species present occur within 50 to 100 metres of the forest edges or a natural break, suggesting that those areas were probably colonised first. Over the years, they have spread throughout the forest, forming the carpets of orchids we see today.

A curious exception to this pattern of spread is the colony of *C. gunnii.* From the size of the colony it has probably been present for 10-30 years, but despite wide searching no other colony has been found in the area.

From a series of visits to the forest, I have followed the natural succession of orchids flowering. During winter and early spring, *Corybas trilobus* is the most common species in flower, being almost super-abundant compared with other *Corybas* and early *Pterostylis* species. Then *Chiloglottis cornuta* emerges together with *Caladenia lyallii* but in superior numbers to the latter. As *C. cornuta* finishes flowering, *Adenochilus gracilis* becomes the major flowering species, again overshadowing the ever-present *C. lyallii.* As summer advances, *Aporostylis bifolia* briefly becomes the major flowering species but is rapidly overtaken by *Caladenia catenata* which, after the warm summer rains, emerges in numbers apparently greater than *C. cornuta.* Finally, *Gastrodia minor* briefly appears as the major flowering species before the summer drought closes the forest access due to the fire risk.

The native orchids at Iwitahi were first 'discovered' in 1985 when Ken Scott noticed some *C. cornuta* plants while on an orienteering run through part of the forest. The area has since been the subject of several field trips by native orchid enthusiasts and was the venue for a highly successful native orchid forum attended by more than 70 people from all over New Zealand in December 1987.

From the first field trip, the unique nature of the area was recognised and it is doubtful whether another area exists in New Zealand with such a variety of species — 27 species have so far been found — and such abundance of each species. During the 1987 forum, much discussion centred on the apparently different forms of several of the orchids at Iwitahi. *Corybas trilobus* was found as the standard dark red-flowered form but also as a green-flowered form, a miniature form, and a form with heavy red markings on the leaves which are normally plain green. The tall pink form of *Caladenia catenata* is very different from the much shorter and smaller green form which was so abundant in late December. *Aporostylis bifolia* also occurs in two distinct forms, one of which has no red spots on the leaves or red stripes on the flowers.

From the first field trip, the vulnerability of the native orchids at Iwitahi was also apparent. Apart from the ever-present danger of forest fires, the pine forest was over mature and the orchids were in imminent danger of destruction from forestry operations of logging and burning prior to replanting new forests of *P. radiata*. However, approaches made to Timberlands, the present owners, were favourably received and a small block of the *P. nigra* has been given reserve status to protect some of the native orchids in the area. Although the block, which is 220 m by 280 m, is too small to survive in perpetuity, it is hoped that it will provide the seed stock to re-establish native orchids through adjacent areas of *P. radiata* forest as they mature.

To ensure survival of all species in the area, less common orchid species are being systematically moved into the reserve from the areas to be logged by members of the Taup Orchid Society. Unfortunately, logging had already started before the reserve area was established, and the areas of *Calochilus robertsonii* under the pines had already disappeared. The striped blue sun orchid identified as *Thelymitra venosa* in 1985 was not found in 1987 and may be the first total casualty of the logging as the moist areas where these plants were previously found have become dry and arid with the removal of the adjacent pines.

References

Molloy, B. and Johns, J. 1983. *Chiloglottis gunnii* Lindley, a new orchid record for New Zealand. The Orchadian 7: 210-214.

The following list of species from the Iwitahi area is taken from the list compiled by Chris Ecroyd, 33 Raniera Place, Rotorua. Notes on flowering are for 5-6 December: fl = flowering, b = buds, s = seed pods, otherwise leaves only found. Indications of orchid population densities: a = abundant, c = common, u = uncommon, r = rare.

1. *Adenochilus gracilis*	fl,a. third most common orchid
2. *Aporostylis bifolia*	b,a. two forms
3. *Caladenia catenata*	fl,u-a. two distinct types
4. *Caladenia iridescens*	fl,u.
5. *Caladenia lyallii*	fl,c.
6. *Calochilus robertsonii*	fl,u. on roadsides.
7. *Chiloglottis cornuta*	fl,a. most common orchid
8. *Chiloglottis gunnii*	fl,r. only one clump known
9. *Corybas acuminatus*	r. two patches found
10. *Corybas macranthus*	fl,r. three patches found
11. *Corybas trilobus*	s,a. second most common orchid
12. *Earina mucronata*	r. found on newly fallen trees
13. *Gastrodia cunninghamii*	b,r. only 10 plants found
14. *Gastrodia minor*	b,r-c. late emerging
15. *Microtis parviflora*	fl,r.
16. *Microtis unifolia*	fl,c. only flowering in open
17. *Orthoceras strictum*	b,r.
18. *Prasophyllum colensoi*	fl,r. on road margin only
19. *Pterostylis alobula*	r.
20. *Pterostylis banksii*	fl,r.
21. *Pterostylis cardiostygma*	fl,u.
22. *Pterostylis* sp	fl,r. (similar to *P. graminea*)
23. *Pterostylis patens*	fl,u.
24. *Thelymitra decora*	fl,c.
25. *Thelymitra longifolia*	fl,c. on road sides
26. *Thelymitra pauciflora*	fl,c. on road sides
27. *Thelymitra* sp	(Dec. 1985, striped flowers identified as *T. venosa* by Dorothy Cooper. Not found Dec. 1987)

THE GENUS *PTEROSTYLIS* IN AUSTRALIA AND NEW ZEALAND: PART 2

Leo Cady
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(Editor's note: Part 1 of this series was published in The Orchadian 8: 183-188.)

Pollination

The pollination of this genus is rather unique. It is generally carried out by small mosquito like flies belonging to the *Mycetophilidae*, *Culicidae*, and *Chinonidae*. It appears that each species has its very own pollinating insect, the procedure being carried out as described below.

The labellum is hinged on a strap like appendage from the column foot. In most species of the genus, this hinge is irritable to various degrees, the amount of movement differing greatly between the sections of the genus. For example, the labellum in species of the *Ptst. plumosa* complex has little movement, but in the so-called "Rufous group", the labellum moves at an incredible speed, returning against the column and column wings at the slightest disturbance to form a tube with the column wings where the attending insect is trapped, the only way out being through the column wings.

The plant is rather selective as to its pollinator. If the insect is too large it will not fit through the escape opening, but if the insect is too small, it will go through easily and will not contact the viscid disc and so will not remove the pollinia; only the insect of the right size can carry out the pollinia removal. The plant in its wisdom has provided cilia as a foothold for the insect as it crawls through the escape tunnel. The insect pushes its way through the tube where, at the outlet of the column wings, the pollinia with its sticky viscid disc is situated. The insect, as it pushes past the pollinia, has it attached to its body (Cady and Rotherham 1970). The insect is lured back to another plant, going through a similar procedure by being trapped again in the tube, but in its flurry to escape it smears pollen grains over the stigma which is usually situated about the centre of the column. The pollen grains germinate on the sticky surface of the stigma, sending their tubes down into the ovary so that the pollen nucleus can unite with the ovule, thus effecting fertilization.

As far as is known, forms of *Ptst. foliata*, *Ptst. obtusa* (syn. *Ptst. crypta*), *Ptst. nana* (syn. *Ptst. celans*), and some *Ptst. parviflora*, along with the New Zealand *Ptst. humilis* and *Ptst. cardiostigma*, are the only *Pterostylis* that are regarded as selfpollinating. After the seed capsule has formed, the seed takes approximately three months to ripen and the capsule to dehisce. In some species such as *Ptst. cucullata*, the flowering stem elongates to aid in wind dispersal of the seed.

Pollinating Lures

It is not known just what lures the insect to the flower, but it is documented that some species can omit an odour with weather changes.

Notes on new species since Part I

Since Part I went to press (Orchadian 8: 183-188), we find the publication of five new species in the South Australian Flora Vol. 4, and by the courtesy of Mrs. Dorothy Cooper of New Zealand a further species for that country:

1. *Ptst. erythroconsha* M. Clements et D. Jones
2. *Ptst. excelsa* M. Clements
3. *Ptst. dolichochila* D. Jones et M. Clements
4. *Ptst. ovata* M. Clements
5. *Ptst. xerophila* M. Clements
6. *Ptst. cardiostigma* D. Cooper

These plants are accepted into our key (published in Orchadian 8: 186-187) and are allocated to the following sections: Nos. 1 and 3 under B1; Nos. 2 and 4 under G4; No. 5 under G3; and No. 6 under D.

Pterostylis R.Br., Prod. 326 (1810), nom. cons.

Terrestrial herbs with small to medium size tubers, and wandering succulent slender roots terminating in a tuber. Leaves in a basal rosette, more or less ovate to oblong ovate or with the rosettes separate from the flowering stem. The flowering stem with cauline lanceolate to linear to sheathing bracts of varying length. Flowers solitary, few or many depending on the section, in a terminal raceme, very variable in size. Prevailing colour is green and white but often with red, red-brown tints, striates or suffusions. Dorsal sepal very concave, in most species incurved, its lateral margins dovetailed into or connate with those of the petals to form a hood or galea over the column. Lateral sepals more or less connate in their lower portions to form an erect lip in front of the column, or deflexed against the ovary or rarely spreading, their free portions divergent and often tapering into fine acute or filiform caudae. Labellum extremely variable in size and shape, mainly in three distinct forms: (1) ovate to oblong to lanceolate to linear strap like with a pencillate curved appendage; (2) filiform with dense or sparse hairs; and (3) thick slipper-shaped when viewed from the side with no basal appendage, margins with setae. All forms are attached to a projecting foot of the column by a moveable straplike claw. Lamina is mainly entire but can be notched or bifid in some species. Column elongate inside the hood and more or less attached to the medium line of the dorsal sepal, the upper part with translucent hatchet-shaped wings (from where the name Ptero and Stylis meaning winged style comes from) on either side of the beaklike rostellum, the base extending into a nearly horizontal foot. Anther very blunt, two celled. Four pollinia, powdery. Stigma often prominent near the middle of the column, rostellum higher up just below the pollinia. Caudicle absent.

A comparatively large genus upwards of 70 (at present) species endemic to the Australasian area.

It is proposed to progressively work through the sections of the key dealing with all plants in each section in their turn.

Section A1

Species found in this section are: *baptistii, curta,* X *furcillata,* X *ingens, nutans* var. *nutans, stricta, acuminata,* and *ophioglossa* subsp. *ophioglossa.*

Ptst. acuminata and *Ptst. ophioglossa* subsp. *ophioglossa* can be borderline and it was felt better to describe them here than in section A2 as placed. Also, after further study, it was felt more appropriate to place *Ptst. scabrida* into section C with *furcata, dubia* and, *foliata.*

1. *Pterostylis acuminata* R.Br., Prod. 326 (1810).

A very slender terrestrial herb with tubers, up to 20 cm high. Leaves rosulate, 5-8, shortly stalked, ovate to broad lanceolate. Stem bracts 1-2, often hard to distinguish. Flowers usually solitary, green with translucent patches at the base, the tip of the dorsal sepal and the petals touched with dark or red brown, up to 2.5 cm long, erect or slightly inclined forwards. Dorsal sepal erect for half its length then curving sharply to the horizontal and ending in a fine acuminate point. Petals acuminate, not as long as the dorsal sepal. Lateral sepals connate for about one-third their length, this section being very narrow at the base and not very gibbous at the junction which forms a wide V-shaped sinus, the free portions becoming filiform above the hood. Labellum about 16 mm long, broad, linear, acuminate, curving from about the centre and projecting well through the sinus when set. Appendage curved, pencillate. Column about as long as the labellum, the upper wings acute, lower lobes filiform with narrow obtuse margins at times glabrous or sparsely ciliate. Stigma rather prominent. **Plate 3, Fig. d.**

Flowering period: March to June at time slightly earlier.

Common Name: Sharp Greenhood.

Distribution: Eastern NSW, South-east Queensland. Other Australian records are thought to be erroneous.

Discussion: In NSW, this species is one of the first of the rosette types to come into flower, but it often produces large colonies of non-flowering rosettes in nature. This species is found spasmodically in marshy or damp areas along the coast, but is occasionally found on the lower mountain slopes.

Growing Notes: I find this species one of the more difficult to grow well in pots. It is often slow to multiply and frequently will fail to reappear in the next year or will emerge with very reduced numbers. It can be tardy to flower.

2. *Pterostylis baptistii* Fitzg., Austral. Orch. 1 (1):[t.2] (1875).

A terrestrial herb with tubers, slender, up to 40 cm high, often much shorter. Leaves in a basal rosette, 5-8, shortly petiolate (stalked), oblong to broadly lanceolate, the lamina conspicuously reticulate veined. Stem bracts usually 2. Flowers probably the largest in the genus, up to 6 cm long, erect, light green with fawn coloured bands and markings or at times deeper green with dark brown markings, usually solitary. Dorsal sepal erect for over half its length then curving gracefully to a short acute point that slightly exceeds the broad petals. Lower sepals erect, united for about one-third their length, very broad at the V-shaped sinus of their junction, slightly gibbous, the free extensions suddenly narrowing and retracting across the hood, extending often for up to 4 cm beyond. Labellum broad, linear, up to 2.5 cm long, straight for most its length then suddenly constricted and deflexed at its apex. Appendage curved, pencillate. Column just shorter than the labellum, upper wing lobes filiform to 3 mm long, lower lobes narrowly oblong with inturned ciliate margins. Stigma very long and narrow, its upper end concealed by the lower wing lobes. **Plate 2, Fig. a, b, c.**

Flowering period: August to November, although Form 3 can flower as early as March.

Common Name: King of the Greenhoods.

Distribution: Coastal division from Queensland to eastern Victoria.

Discussion: *Pterostylis baptistii* at present appears in three distinct forms:

(1) A large robust plant usually found growing in scattered isolated groups, rarely in dense colonies; the rosette of leaves often to 12 cm across with the plants up to 40 cm tall (Plate 2, Fig. a);

(2) What I regard as the colony type; a much smaller plant with more acute segments, usually wholly green tones or with a very small touch of brown on the edges of the petals. This usually grows in dense colonies in grassy situations under trees and rarely gets any higher than 20 cm tall (Plate 2, Fig. b); and

(3) The type illustrated on page 155 in Alick Dockrill's book "Australian Indigenous Orchids" under the name of *Ptst. baptistii*, and commonly referred to as the early flowering "baptistii" in the southern states. This plant differs markedly from typical "baptistii" in flower shape, length of labellum, dorsal sepal tip, and particularly in flowering period. The area of distribution as present known is from about Ballina northwards to the Atherton Tablelands. This form I believe will in due course be described as a new species.

Growing Notes: *Ptst. baptistii* in all its forms grows well in cultivation and appears to relish an extra ration of food; liquid cow manure or such at about one-third strength is beneficial when the plants are in active growth.

Form 1 multiplies slowly, whereas form 2 will fill a pot very quickly, while form 3 multiplies well also. With the earlier flowering plant, watch out for red spider mite and treat with diluted miticide or similar product. As soon as any sign of the mite occurs, treat promptly as this mite multiplies very swiftly and can become a major problem in a short time. Water misting of the leaves can also be a deterrent to the mite.

3. *Pterostylis curta* R.Br., Prod. 326 (1810).

A terrestrial herb with tubers, usually a robust plant up to 26 cm high. Leaves of the rosette are petiolate, ovate but varying. Stem bracts usually 2. Flowers mostly solitary, but multiple flowers have been found, up to 3 cm but often smaller, green, tinted with brown, hood erect curving to a blunt but acute point. Petals just shorter than the dorsal sepal. Lateral sepals erect, united for about half their length then diverging into short acuminate caudae, generally not extending beyond the hood, the V-shaped sinus shallow, the segment connected to the hood only at the basal third then distinctly clear of the petals forming a bulge where the sepals diverge. Labellum oblong, the lamina 12-14 mm long, greenish with a prominent dark brown raised midrib, the labellum with a distinct twist from above the middle. The appendage curved, pencillate. Column very erect, longer than the labellum. Wings with short, acute upper lobes and oblong lower lobes, margins inturned, ciliate. Stigma inconspicuous. **Plate 2, Fig. e.**

Flowering period: Chiefly July to September but variable.

Distribution: Southern South Australia, Victoria, Tasmania, eastern NSW, ACT, and South-east Queensland.

Common Name: Blunt Greenhood.

Discussion: This species according to Moore (1976) was the plant that R. Brown used as the holotype for the genus even though he described 19 species in his article. It is a extremely common species usually found in large colonies. Its preferred habitat is in the sandy leaf mould behind the sand dunes at the seashore where it grows commonly with *Ptst. concinna* and *Ptst. nutans* var. *nutans*. *Ptst. curta* is fairly stable in its characteristics, varying only slightly in size and colour. The distinctive twisted labellum is probably the easiest recognizable feature.

Culture: This species is an excellent grower in pots. It multiplies exceptionally readily. One pot in my collection started with 5 tubers and in 4 years produced over 90 tubers on repotting. The rosettes break ground in February and the plant begins to flower in July. This is a good beginner's plant.

4. *Pterostylis* X *furcillata* Rupp, Proc. Linn. Soc. NSW 55: 415 (1930)

A terrestrial herb with tubers, slender, 10-20 cm high. Leaves generally in a rosette but they can be missing, 1-4, commonly 2, ovate to lanceolate, very slightly petiolate and similar to the 1-2 foliaceous stem bracts. Flowers solitary, about 2.5 cm long, green with darker bands. Hood curving for the whole length, sometimes up to 5 cm long around

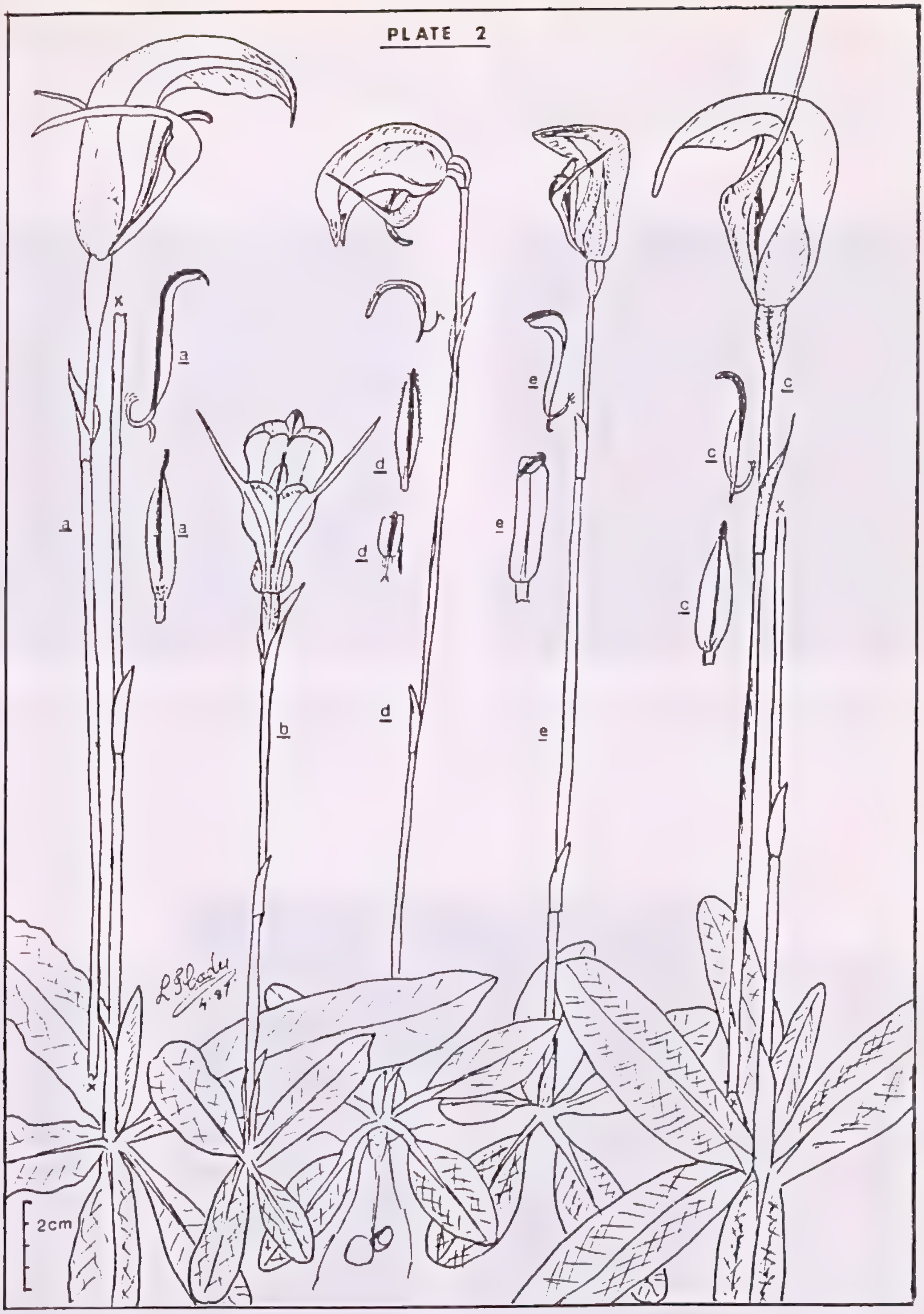
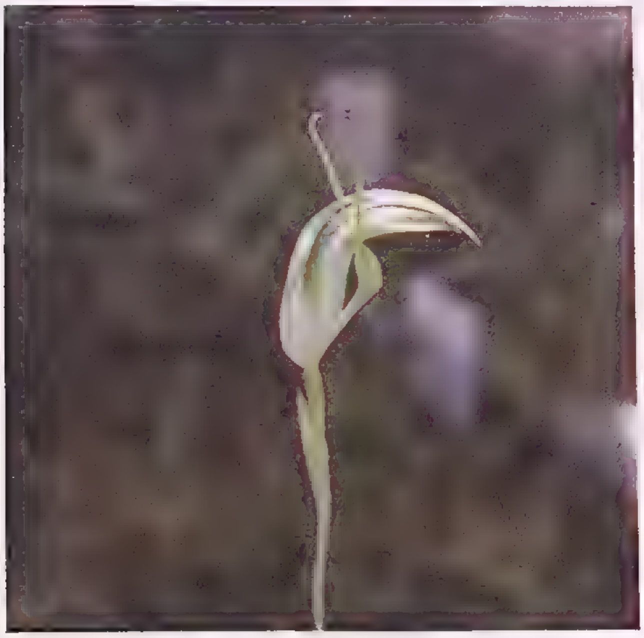


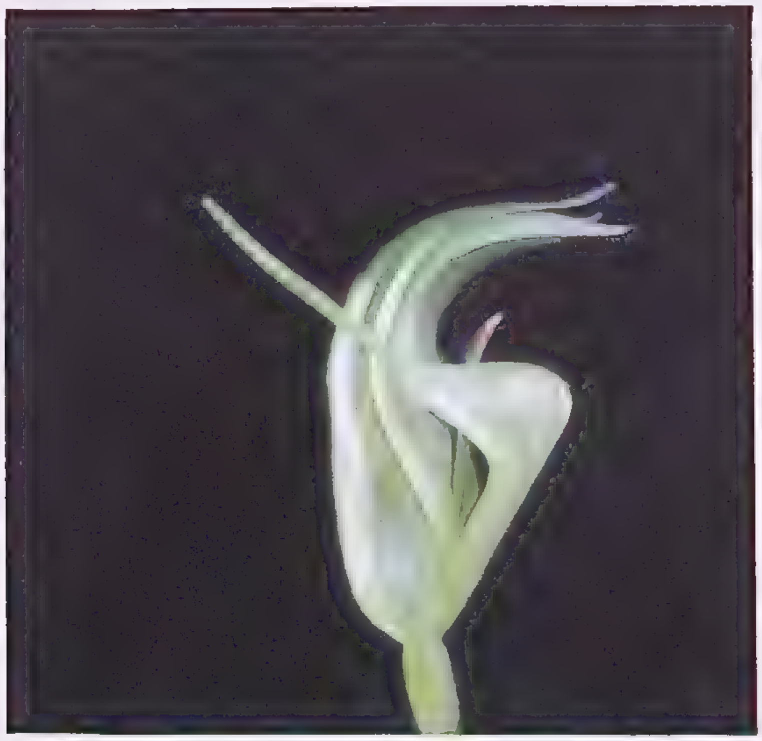
Plate 2. Fig a, *Pterostylis baptistii* – plant and labellum. Natural size to scale; Fig b, *Pterostylis baptistii* – colony form. Natural size to scale; Fig c, *Pterostylis* "baptistii" – Form 3. All parts natural size to scale; Fig d, *Pterostylis nutans* var *nutans*. All parts natural size to scale; Fig e, Pterostylis curta. Plant natural size to scale. Labellum slightly enlarged.

The following colour plates have been supplied by Leo Cady to enhance the descriptions of the Pterostylis *species and natural hybrids discussed in his article - Editor.*

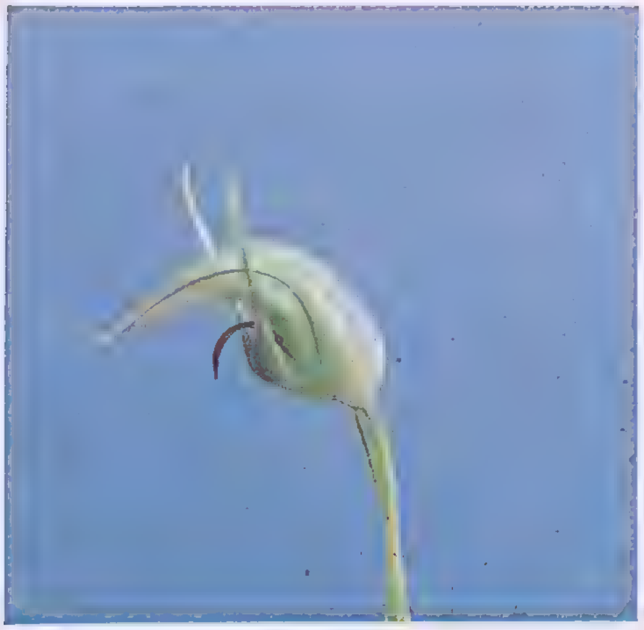


Pterostylis baptistii Fitzg. - Form 3; early flowering form. Photo by Leo Cady.

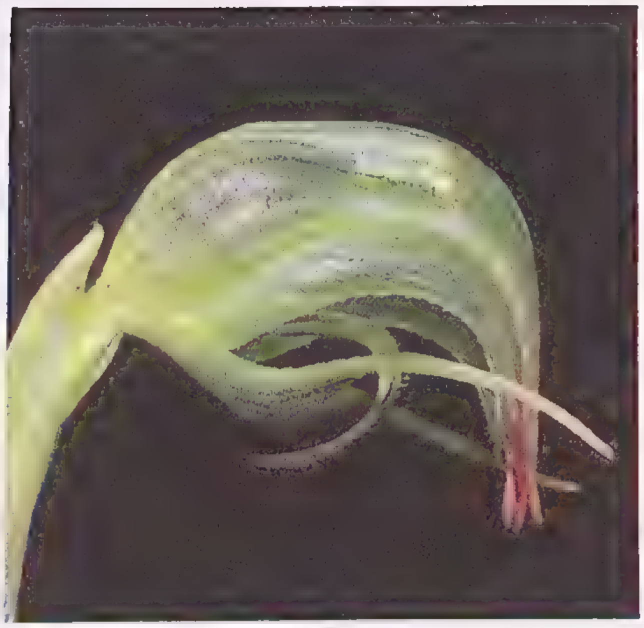
Pterostylis baptistii Fitzg. - Form 2; colony forming type. Photo by Leo Cady.



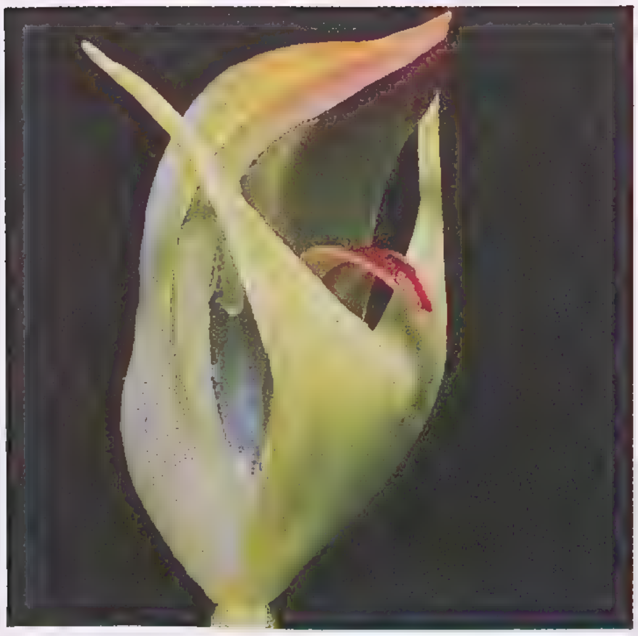
Pterostylis baptistii Fitzg. - Form 1. Photo by Leo Cady.



Pterostylis X *ingens* (Rupp) D. Jones.
Photo by Leo Cady.



Pterostylis nutans R.Br.
Photo by Ron Tunstall.



Pterostylis stricta Clemesh et Gray.
Photo by Ron Tunstall.

Pterostylis hildae Nicholls.
Photo by Leo Cady.

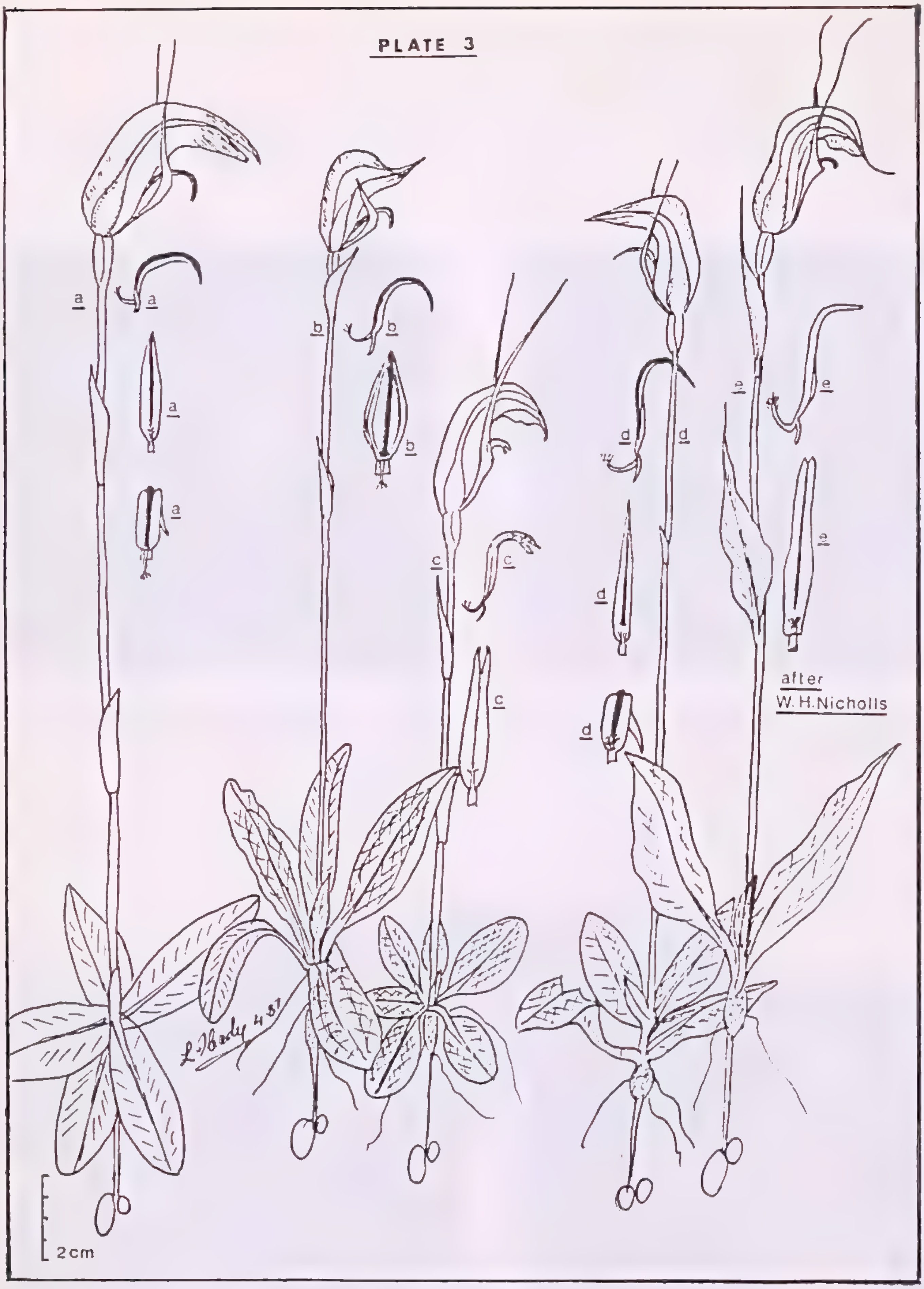


Plate 3. Fig a, *Pterostylis* X *ingens*. All natural size to scale; Fig b, *Pterostylis stricta*. Plant natural size to scale. Labellum x 2; Fig c, *Pterostylis ophioglossa* ssp. *ophioglossa* var. *ophioglossa*. Plant natural size to scale. Labellum x 2; Fig d, *Pterostylis acuminata*. Plant natural size to scale. Labellum x 2; Fig e, *Pterostylis* X *furcillata*. Plant natural size to scale. Labellum x 2.

the curve. Dorsal sepal considerably longer than the petals and ending in a more or less decurved fine point. Lower sepals erect, connate for over one third their length, gibbous at the junction which forms a very wide nonangular sinus. Free portions extending into long filiform caudae ending high above the hood. Labellum broad, linear with an emarginate or slightly bifid tip, lamina about 14 mm long. Appendage curved and pencillate. Column about as long as the labellum, slightly incurved, upper wings acuminate, lower wings obtuse with sparsely ciliate margins. Stigma narrow but conspicuous. **Plate 3, Fig. e.**

Flowering period: March to May.

Common Name: None.

Distribution: Very localised, north NSW, Kurri Kurri, Weston, Abermain area, very rare.

Discussion: This plant is now regarded as a hybrid. Rupp considered this to be a cross between *Ptst. obtusa* and *Ptst. ophioglossa* or perhaps *Ptst. concinna.*

I have seen plants recently collected in the Weston area and named as this hybrid, but they certainly did not resemble the plant that Nicholls depicts as Rupp's plant. I am of the opinion that the plants sent by Rupp and drawn by Nicholls in "Orchids of Australia" (Plate 328) are the result of a cross between *Ptst. reflexa* and *Ptst. ophioglossa.*

Growing Notes: I can offer no details on this species at all as it has rarely been collected.

5. *Pterostylis* X *ingens* (Rupp) D. Jones, Orchadian 5: 54 (1976).

A terrestrial herb with tubers, up to 20 cm tall. Leaves 3-6, generally in a basal rosette, ovate, lanceolate, veins of the lamina prominently reticulate. Stem bracts usually 2. Flowers solitary, up to 4.5 cm long, erect, mid-green with red-brown flushes at the apex and translucent patches towards the base of the flower. Dorsal sepal sweeping from the gibbous base of the hood to an acuminate apex. Petals not quite as long as the dorsal sepal, darker green, tipped red-brown. Lateral sepals connate (connected) for about half their length then divided into a flat V-shaped sinus before extending into acuminate filiform caudae which exceed the hood by up to 2 cm, segment attached to the base of the hood for about one third its length then separates from the hood into a bulge at the sinus. Labellum broad, lanceolate, green with a chocolate coloured midrib, the lamina finely pubescent with a forward curve just above the centre allowing it to protrude through the sinus in its set position, appendage curved, pencillate. Column higher than the naturally positioned labellum. Stigma inconspicuous. **Plate 3, Fig. a.**

Flowering period: September to November, at times as early as August and as late as December.

Common Name: Pointed Greenhood.

Distribution: Victoria, eastern NSW, Tasmania, South Australia (Weber and Bates 1986).

Discussion: This plant has been around for a long time and has had a few changes of name. It was first described by the Reverend Rupp in 1928 as a variety to *Ptst. acuminata* but he later formed the opinion that the plant was distinct enough to stand as a species. However, as far as my research shows, he did not do anything about it. The plant according to David Jones is a natural hybrid between *Ptst. nutans* var. *nutans* and *Ptst. furcata* and in the Orchadian 5: 54 (1976), he made the necessary changes to correct the situation. As a hybrid, its only natural that this plant will vary somewhat. David Jones in the above article refers to the presence of back crosses between *Ptst.* X *ingens* and its parents causing hybrid swarms in some areas.

Leaf presentation can also be erratic; plants that have a basal rosette follow the *Ptst. nutans* var. *nutans* influence but can also show the influence of *Ptst. furcata* by having little or no rosette but with leaves up the stem as in the latter species.

Growing Notes: Plants in cultivation seem to be good growers. I have had plants for 2 years now and the plants have been slow to multiply in the first year but are now flowering and multiplying well.

6. *Pterostylis nutans* R.Br. var. *nutans* R.Br., Prod. 327 (1810).

A terrestrial herb with tubers. Slender to robust up to 40 cm tall. Leaves in a basal rosette, petiolate, up to 5, variable in shape and leaf margins, ovate to oblong, often undulate. Stem bracts 2-3. Flowers usually solitary, 2-3 cm long, conspicuously bent forward (nodding), green with some translucent patches. Dorsal sepal greatly curved for almost its entire length, acute. Petals as long as or almost as long as the dorsal sepal, both these segments often disunite at the very apex. Lateral sepals connate for their basal third to half, the sinus formed is wide but sharp angled, free portion linear, slightly exceeding the hood. Labellum broad linear, 13-16 mm long, much recurved from about the centre, green to dark green with a dark reddish-brown midrib, surface covered with fine papillae (glandular hairs), appendage linear, curved, pencillate. Column longer than the labellum, upper wings rounded with filiforms, lower wings oblong with inturned ciliate margins. Stigma long and narrow. **Plate 2, Fig. d.**

Flowering period: July to October or as late as December in mountain areas.

Common name: Nodding Greenhood, Parrot's Beak Orchid, Cowshorn Orchid.

Distribution: Temperate areas of all Australian states excepting Western Australia. In Herbarium Cady (no 2711), a record from the Eungella Range North Queensland; also recorded for New Zealand where, according to Moore (1976), plants could now be extinct.

Known variety: Variety *hispidula* Fitzg. to be dealt with in Section A2.

Discussion: This species is possibly one of our commonest greenhoods. It is found in many habitats, though generally avoiding open plains country and mallee scrub, preferring mainly lightly forested areas in undergrowth, particularly in sandy areas behind the beach where it can be seen in vast colonies. It is easy to flower.

Growing notes: This orchid is an excellent beginner's plant, which grows, flowers, and multiples well. There is some variation between the lush coastal forms and the harsher inland forms but both are easily recognizable as this species. Plants can vary from as little as 4 cm to 40 cm in height.

7. *Pterostylis ophioglossa* R.Br. subsp. *ophioglossa* var. *ophioglossa* R.Br., Prod. 326 (1810).

A slender terrestrial herb with tubers, up to 25 cm tall. Leaves up to 6 in a basal rosette, ovate, shortly petiolate. Stem bracts 2 or can be absent with only the floral bract present. Flowers usually solitary, very variable in size and colour, up to 3.5 cm long but usually smaller, green with translucent patches, the top of the hood often suffused and striped with pink, brown-red or red purple. Flower upright or slightly inclined forward. Dorsal sepal acuminate, generally deflexed at the apex, slightly longer than the broad truncated petals. Lateral sepals erect, connate for about one quarter, the junction forming a very wide sinus, the free caudae filiform, divergent, finishing high above the hood. Labellum oblong-linear, to 16 mm long, dark red-brown towards the apex, lighter towards the base, the apex narrowly but deeply bifid, the lamina curved almost to a right angle from above, the middle protruding well through the sinus of the lateral sepals, appendage linear, curved, pencillated. Column about as long as the labellum with rather narrow wings, the lower lobes oblong-obtuse, the upper lobes acuminate. Stigma oblong, close under the wings. **Plate 3, Fig. c.**

Flowering period: April to July.

Common name: Snake's Tongue Greenhood.

Distribution: North-eastern NSW, south-eastern Queensland, also in New Caladonia. Chiefly coastal.

Known varieties: Subspecies *fusca* Clemesha to be dealt with in section A2, as is variety *collina* Rupp.

Discussion: A reasonably common orchid in its range extending into New Caladonia where it was known under the name of *Ptst. tenuicauda*. This species is a very variable plant, comprising at present of three distinct forms, the subspecies *ophioglossa*, and *fusca*, and the variety *collina*. Subspecies *fusca* is a plant found in the drier region of the Atherton Tablelands, while variety *collina* is found in the Paterson Valley.

The type form is a good grower and multiplies well, forming large colonies in nature, and soon fills a pot in cultivation. Rupp, in his discussion of this species in "The Orchids of N.S.W." (1943) 82, suggested that *Ptst. ophioglossa* could have been the result of a natural crossing of *Ptst. concinna* and *Ptst. truncata*. This view is, I feel, only circumstantial.

8. *Pterostylis stricta* Clemesha et B. Gray. Orchadian 4: 18 (1972).

A slender herb with tubers, up to 20 cm high. Leaves 4-6 in a basal rosette, oblong-ovate, 1.3-4.5 cm long by 9-16 mm wide, the margins often undulate with prominent reticulate veining. Stems slender with three sheathing bracts. Flowers usually solitary, erect, green with translucent patches towards the base, the tip of the hood flushed red-brown. Dorsal sepal erect for two-thirds its length then curving towards an upturned, acute tip, glabrous, 2.6 cm long. Petals falcate-lanceolate, acuminate, as long as the dorsal sepal. Lateral sepals united for up to half their length then diverging into a wide V-shaped sinus, the caudae formed extending only to the top of the galea, the segment curves from the base of the hood then separates from it by a space of 6mm. Labellum very prominently broad lanceolate, when flattened 14-16 mm long by 4.5-5 mm wide, erect for two-thirds its length then abruptly curves forward to exceed the sinus by 4-6 mm, untwisted, green and red-brown with a darker prominent keel. Column curved, higher than the labellum curve, stigma rather narrow, conspicuous. **Plate 3, Fig. b.**

Flowering period: Period in habitat, March to May.

Common name: Broad Tongue Greenhood.

Distribution: Highlands of north-eastern Queensland above 800 m, in open forest areas of most Ranges, the full extent of this plant is as yet unknown.

Discussion: Even though this species was only described in 1972, it was known to occur in the latter part of last century when Karsten collected specimens at Bellenden Ker. It was, until its description in 1972, classified as the northern form of *Ptst. curta*, a species, along with *Ptst. hildae*, that it does superficially resemble.

This species is the plant that Alick Dockrill described as *Ptst. hildae* in his monumental work "Australian Indigenous Orchids". The characters which separate it from the above two species are the sharply upturned tip to the galea and the enormous labellum for the size of the plant. This segment is probably the first and most prominent thing noticed when first viewing the plant. It also has a much early flowering period in nature.

Growing notes: This plant is not commonly found in collections, so not a great deal is known regarding its likes and dislikes. I find it a reasonable grower but have not had it long enough to collect a lot of data. One thing noted by a number of other growers is the changing of the flowering period when cultivated in Sydney. For example, while *Ptst. curta* and *Ptst. hildae* in their natural habitat flower in spring and *Ptst. stricta* flowers in autumn, the first two become autumn flowerers in cultivation at Atherton and *Ptst. stricta* becomes a spring flowerer in Sydney.

References

Cady, L. and Rotherham, E.R. 1970. Australian Native Orchids in Colour. A.H. & A.W. Reed, Sydney. Plates 5 and 6.

Moore, L.B. and Edger, E. 1976. Flora of New Zealand 2: 132.

Weber, J. and Bates, R. 1986. South Australian Flora 4: 21111-2131.

READER'S FORUM

The Editor,
The Orchadian,
Sydney.

Dear Sir,

I am currently working on a biography of the celebrated Australian orchidologist, the Reverend H.M.R. Rupp (1872-1956).

Mr Rupp had a wide circle of botanical correspondents with whom he maintained a vigorous correspondence. These letters are now of considerable historical and botanical significance, and of course, are quite crucial sources of biographical information.

If any readers should have, or know of, some Rupp letters, or indeed, have personal anecdotes or other information relating to this interesting man, I should be pleased to hear from them. If in addition, such people would be prepared to agree to the copying, or even the outright donation of letters to the Rupp Papers in the Sydney Royal Botanic Gardens Library, then this, too, would be greatly welcomed.

Clearly much has already been lost - for instance, no trace has been found of the enormous correspondence between Rupp and such correspondents as Dr R.S. Rogers of Adelaide, Dr Hugo Flecker of Cairns or Mrs Edith Coleman of Melbourne. But who knows what may turn up?

Thank you for the opportunity to make known this project.

Yours etc.,

Lionel Gilbert,
151 Brown Street,
ARMIDALE. N.S.W. 2350

W.H. (BILL) MURDOCH; AWARD OF HONOUR, AUSTRALIAN ORCHID FOUNDATION

(The following article has been compiled from: "W.H. (Bill) Murdoch .. A Condensed Autobiography" by Richard Hall which appeared in the February, 1988, issue of the A.N.O.S. Newcastle Bulletin; "Bill Murdoch Honored by Australian Orchid Foundation" by Noel Grundon which appeared in the March, 1988, issue of Native Orchid News, the journal of the Native Orchid Society of Toowoomba Inc.; and from notes of early meetings to establish ANOS, supplied by Walter Upton — Editor.)

In 1987, the Australian Orchid Foundation initiated the Award of Honour to recognise an outstanding contribution to orchids in Australia. In the first year of this award, the contributions of three people have been recognised; Bill Murdoch, Gerald McCraith, and Herman Slade. This article details the contribution made by W.H. (Bill) Murdoch.

Presentation of the Award of Honour

When Bill Murdoch was presented with the Australian Orchid Foundation "Award of Honour" at the January meeting of Newcastle A.N.O.S. Group, in excess of 100 persons were present. A group from Toowoomba represented the Darling Downs Group of A.N.O.S., and a large contingent from Sydney was led by Murray Corrigan, President of A.N.O.S., and included Walter and Jill Upton, and Michael Harrison. Representatives from other orchid societies in the Newcastle, Lake Macquarie, and Maitland areas, and many members of Bill's family were also present.

Mr. Frank Slattery of Sydney who is a Director of the Australian Orchid Foundation, made the presentation and spoke of Bill's contribution to orchids. Many other speakers also paid tribute to Bill for his contribution to orchids and his efforts which culminated in the establishment of the Australasian Native Orchid Society.

Bill Murdoch – The Man.

Bill was born in South Gippsland, Victoria, in the farming district of Poowong, on 17 September 1895. The family were burnt out in the Gippsland fires of 1898 and moved to the new coalfields of Outtrim. Bill commenced school in 1901, the family moved to another mining town, Jumbunna, and later moved again to Kurri Kurri, on the Maitland coalfields in N.S.W. He attended Kurri Kurri school on the first day it opened in 1904.

Leaving school the week before his 14th birthday, he worked successfully at brickmaking, carpentry, blacksmith's striker, in three grocery shops, two collieries, and also laying tracks to the B.H.P. works Newcastle which were then being built.

A Defence Act passed in 1905 made all Australian males liable to perform National Service, firstly as cadets from 16 to 18 years of age, and then in the militia. Bill commenced National Service in July, 1911, and after two years was transferred to the militia as Colour Sergeant (now Sergeant Major). When war broke out in 1914, Bill saw local service, was examined for commissioned rank in the C.M.F., and enlisted in the A.I.F. on 2nd February.

In May, he embarked on H.M.T.S. "Themistocles" for Suez. From Suez he sailed on the "Alaunia" for Gallipoli, arriving at the Dardanelles at nightfall on 17th August. After service there, he was evacuated dangerously ill to Alexandria and finally back to Sydney for more hospital treatment.

Bill next shipped out on the "Euripedes" to England and then to France and front line service in the Somme Valley where he was wounded and evacuated to Stratford-on-Avon in England.

Upon recovery, he rejoined his unit in Flanders. In May, 1918, Bill was evacuated with trench fever to a research hospital and was ready to return to his unit when the armistice was signed.

After discharge from the army, Bill returned to Kurri Kurri where he set up as a greengrocer and was married in January 1921. He next moved to Griffith where he grew wine grapes and then worked in the interest of Soldier Settlers before finally returning to the Hunter Valley to take up dry-land farming at Buttai.

Next, in partnership with his younger brother Arthur, he worked a shell grit lease on the island off Fingal Bay in the Port Stephens area. Arthur wrote a book titled "Real Grit" of their experiences during this period.

Bill joined the Kurri Kurri branch of the R.S.L. and resumed military training as C.O. of Kurri Kurri Company with the drill hall as his responsibility. With the advent of war in 1939, Bill became second in command of the 19th Training Battalion. Appointed as a "Voyage Only Officer", he sailed in

February, 1941, on the "Aquitania" to Bombay, then back to Australia on the "Mauritania", In Australia, he lectured at military establishments on troopship life.

The Army then set up a "Home Force" and Bill was made "Assistant Provost Marshall" for the Second Army, with promotion to the rank of Lieutenant Colonel, transfer to Victoria, and extra duty as Deputy Director of Prisons. After this duty, he requested discharge and assumed command of the 2nd Battalion V.D.C. at Maitland. At the end of the war, Bill purchased his land at Coal Point on Lake Macquarie and built his home there.

Bill is now 93 years of age, with all his mental faculties, although he is physically impaired to some degree. He has very few orchids now, but still retains his interest in them and is always keen to have a chat with any member of the orchid fraternity.

Bill Murdoch and ANOS

At luncheons at the Masonic Club, Sydney, in January and February, 1963, initially with Walter Upton and later with Jim Scott also, Bill had discussions on the possible formation of a society for people interested in growing orchids native to Australasia. An initial public meeting was held on 23 March, 1963, at the Y.W.C.A., Liverpool St., at which an Executive Committee of Bill Murdoch, James Scott, Ronald Kerr, and Walter Upton was appointed to bring about the formation of the Australasian Native Orchid Society.

The inaugural meeting of ANOS took place on 6 July, 1963, the Committee being Bill Murdoch (President), Eric Gordon (Vice-President), James Scott (Vice-President), Walter Upton (Hon. Secretary), John Soiland (Hon. Treasurer), Stephen Clemesha (Ass. Hon. Secretary), R. Curtis (Recordings), Murray Corrigan (Newsletter), and Ronald Kerr (Gazette). The first issue of *The Orchadian* was collated and mailed on 2 September, 1963.

Bill served as President for three years and a further three years as Vice President.

Noel J. Grundon

GROWING TIPS

Cultural hints gleaned from the Newsletters

From the Native Orchid Society of Queensland Bulletin, Feb., 1988. –* Sarcochilus fitzgeraldii *culture by Danny Ross.

I used to have trouble with it until I took particular notice of its natural growing conditions.

All the plants I have observed were growing on rock in heavy shade with cool moist air breezing over them, which I think is the main secret in growing these plants. My plants of *Sarcochilus fitzgeraldii* are housed in the north western corner of my bushhouse. I use one layer of 70% and one layer of 50% shadecloth and a layer of polyscrim on the north and western sides, coming down to eighteen inches off the ground. The polyscrim is there to stop strong winds drying out the plants, but still allow enough breeze to flow through underneath.

I have ferns growing under the benches to sid humidity and I find the best results growing fitzgeraldii in clay saucers with a mix of 50% 20 mm blue metal and 50% medium sequoia bark. The pot is sat on a saucer filled with gravel and kept filled with water at all times. I water two or three times a week during summer and once a week during winter, or if plants look to be drying out too much.

Generally, I fertilize every week or fortnight with one half strength solution of Aquasol. I use 'hoof and horn' and 'blood and bone' three times a year. I throw heaps on, but do not advise this for everyone.

From The South Australian Orchid Bulletin, Dec., 1987; –* Cymbidium canaliculatum *culture by Russell Job.

Cym. canaliculatum has an extremely wide range in the Australian savannah country from near Cobar, N.S.W., around the north and to Broome in W.A. With no rain in the winter months, the sun is fierce and very dry. The roots are fed by sap and wood rotting fungi deep inside the host tree.

The roots may be many metres long. A vert tall 'pot' may be beneficial for *Cymbidium canaliculatum.*

I have seen an earthenware pipe used in the vertical position with *Cym. canaliculatum* growing well.

As a potting mixture, I use old broken down *Eucalyptus* heartwood and some marble chips to keep the acidity low.

For successful culture in the home, the leaves need to be kept dry and the pot watered once a month or less in the winter. In other words, rest the plant until new growth is evident.

This rest period is important and if it is bright enough, the mature plant will have cream flowers for spring.

Low humidity is necessary as well as rare watering. The developing flower spike can catch a fungus that makes the smallest buds drop.

The very dark *Cym. canaliculatum* var *sparkesii* comes from the west of Cape York dividing range, between Mt. Molloy and Coen.

From the Wollongong and District Native Orchid Society Inc. Bulletin, 3 (8). – The Genus **Sarcochilus** *in cultivation by Ron Wheeldon.*

Sarcochilus species and hybrids are without doubt some of the daintiest and most beautiful of our native orchids.

It is gratifying to see so many of our hybridists working on sibling and selfing crosses of these plants. This line of work is essential to take the pressure off the few remaining areas where these beauties are still growing naturally. Such people as Ted Gregory and Neil Finch who are doing line breeding of the species are to be commended for their work and should be supported. *Sarcochilus hartmannii* for instance, is found in many areas in many forms. It differs quite distinctly from area to area, almost to the point of being separate species.

After many years of experimenting with growing conditions and media, I feel I have at last achieved some measure of success.

Sarcochilus seem to favour glasshouse conditions as it is easy to control humidity and air movement. With seedlings, especially, this is essential for success.

Benches are constructed of 20 mm water pipe topped with galvanised trays holding 25 mm of clean graded charcoal kept damp at all times. An electric fan is placed about 450 mm above the bench tops blowing directly over the orchids and is kept running continually, day and night. This allows the orchids to dry off quickly after watering and at the same time supplies them with cool moist air which is always moving. I find that mounted plants such as *Sarco. dilatatus, Sarco. hillii* and *Sarco. falcatus* do very well placed directly opposite the fan.

Growing media is most important. I use mainly terracotta pots and have chosen a very open mix, being of a size consistent with the size of the orchids potted. Terracotta pots allow better air movement to the roots while containing some moisture. I use a 50-50 mix of pine bark and pebbles, sieving out all dust and fines. Bark must be of good hard old condition and the pebbles clean. If the media starts to breakdown, the roots will rot and the plant will die very quickly. For larger orchids, I use up to 20 mm size mix. *Sarcochilus ceciliae* needs a very coarse mix in shallow trays as in nature they usually grow on the surface of large rocks.

Feeding is most important, as, contradictory to some ideas, they do grow all though winter and only slow down during the hot months around February. A regular feeding programme all through the year will have beneficial results. After all, we all try to achieve flowering size plants in the shortest possible time.

I use four different nutrients, all at about quarter strength; one week organic, the next inorganic. Week one I use Fish Emulsion; week, two Aquasol with just a trace of magnesium sulphate and chealated iron; week three, Nitrosol, and week four, Wuxal. Add to these mixtures one ml Chemspread (wetting agent) to each litre of water with two drops of Formula 20 per litre. This mixture is then sprayed on thoroughly covering the foliage.

Constant attention to feeding, water requirements, pest control, and general hygiene will be generously rewarded with rapid growth and a beautiful display in spring.

From Native Orchid News, the Journal of the Native Orchid Society of Toowoomba Inc., Dec., 1987. – Culture of **Sarcochilus** *Southern Cross by Wayne V. Reis.*

I have owned my plant for about 12 years as it was one of Ira Butler's seedlings. From what I can recall when I first obtained the seedling, it would have been in a 2" pot in bark and charcoal. I continued using this mix, progressing up to a 4" pot. I have always grown it under 60-70% shade. Years ago, I mounted it on compressed cork, then about five years ago, I mounted it on a piece of bottlebrush limb (*Callistemon* sp.). The plant is still on the bottlebrush — growing and flowering quite merrily apart for one small hiccup; I damped the crown out of the plant but it soon developed four new growths and had not looked back.

If I were to reslab now, I would use a tube made from gutter guard mesh or smaller mesh (depending on which plant I am mounting) filled with a mix of bark, charcoal, and granite. I experimented with these tubes years ago and have found them to be a very suitable and long lasting mount for many different genera.

AUSTRALIAN NATIVE ORCHID HYBRIDS

New registrations by the Royal Horticultural Society from lists in the Orchid Review, Jan. – Mar., 1988.

NAME	PARENTAGE	REGISTERED BY
Dendrobium		
Aussie Charm	Ellen x Gillian Leaney	P. Spence
Aussie Dream	Ellen x *fleckeri*	P. Spence
Aussie Magic	Eureka x Hilda Poxon	P. Spence
Aussie Reward	Specio-kingianum x Aussie Starlight	P. Spence
Aussie Sequins	Aussie Bonanza x *kingianum*	P. Spence
Aussie Treasure	Ella Victoria Leaney x Eureka	P. Spence
Aussie Treat	Ellen x Peter	P. Spence
Brinawa	Hilda Poxon x *bigibbum*	J. Jarvis
Colreka	Colin x Eureka	W.T. Upton
Dilgry	*speciosum* x Bardo Rose	Merrellen
Elinjaa	Graham Hewitt x *tetragonum*	N. Roper
Gracious Star	*tetragonum* x Gracious Falcon	W.T. Upton
Hot Shot	Hilda Poxon x Golden Fleck	W.T. Upton
Ingleside	John Upton x *speciosum*	W.T. Upton
Jesmond Gem	Yondi x *speciosum*	J. Purvis
Julatten	*kingianum* x Graham Hewitt	N. Roper
Karen Nair	Jamie Upton x Wonga	W.T. Upton
Narraweena	Colin x Gillian Leaney	W.T. Upton
Nugget	Eureka x *gracilicaule*	W.T. Upton
Pinterry	Ellen x Graham Hewitt	N. Roper
Regal Rose	Blushing Rose x *speciosum*	W.T. Upton
Rutherford Sunstar	*tetragonum* x Gracious Cascades	T.J. Smith
Star Falcon	Star of Gold x *falcorostrum*	R. Harris
Wakehurst	John Upton x Kungara	W.T. Upton
Woko	*speciosum* x Wonga	Merrellen
Dendrogeria		
Mistique	*Den.* Ellen x *Flickingeria comata*	W.T. Upton
Pterostylis		
Bantam	*baptistii* x *pedunculata*	L. & M. Nesbitt
Rhinochilus		
Aussie Passion	*Sarco.* Fitzhart x *Rhin. divitiflora*	P. Spence
Sarcochilus		
Empress	Lois x *ceciliae*	R. & D. Sheen
Bongeen	Mavis x *fitzgeraldii*	N. Grundon

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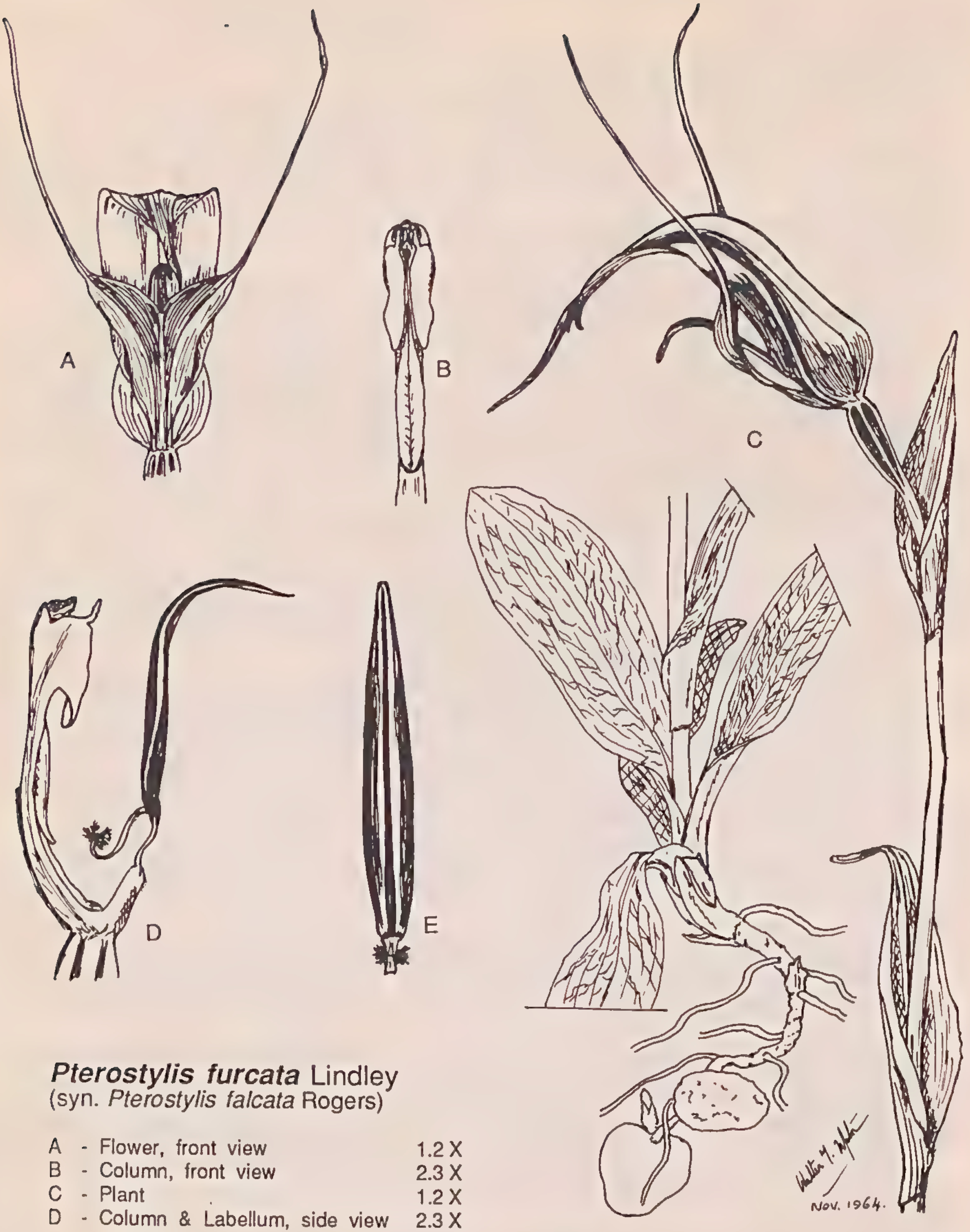

Nov. 1964.

Pterostylis furcata Lindley
(syn. *Pterostylis falcata* Rogers)

A - Flower, front view 1.2 X
B - Column, front view 2.3 X
C - Plant 1.2 X
D - Column & Labellum, side view 2.3 X
E - Labellum 2.3 X

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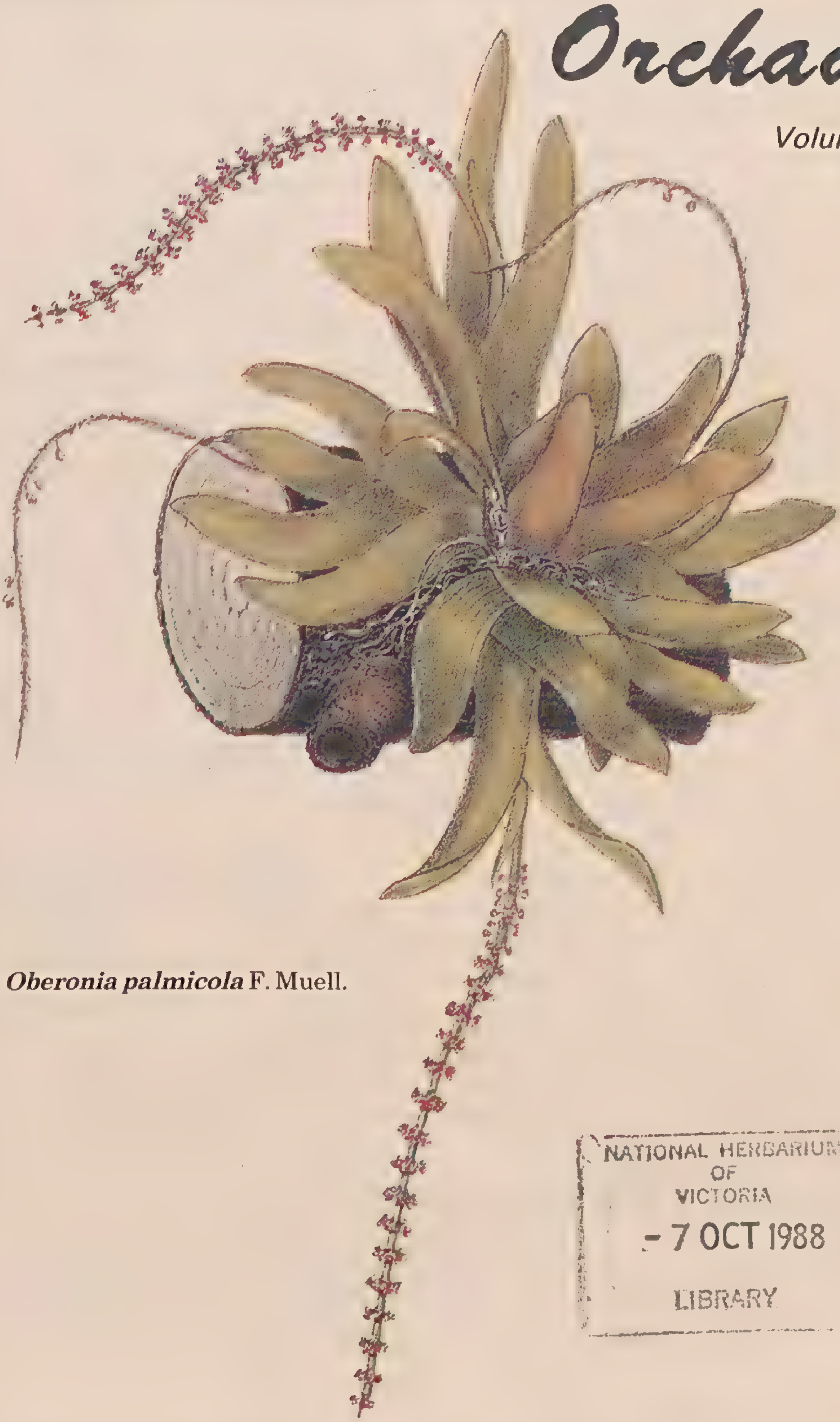

Oberonia palmicola F. Muell.

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(a) orchid species occurring naturally in the Commonwealth of Australia and its Territories, New Zealand, New Caledonia, Vanuatu, Tuvalu, Fiji, West Irian, Papua New Guinea, Kiribati, all islands south-east of a line joining 0° Latitude 130° East Longitude and 20° South Latitude and 120° East Longitude, and all islands east of Australia to the International Date Line and south of the equator, and

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Date distributed: OCTOBER 4th, 1988

EDITORIAL

In the March Editorial, I concentrated on the conservation of our native orchids. While I do not like to return to the same subject in the following Editorial, conservation is a large issue, invoking such strong feelings and responses, that it can not be dealt with adequately on a single page. Furthermore, one aspect of conservation has been a sore point with me for many years.

The major thrust with some conservation movements seems to be the preservation of the natural order of things, even if it means the death and, possible extinction, of the species. Let me explain this a little more fully. Our national parks are locations where we expect that our flora and fauna can survive with the minimum input or interference from man. But is this really so? Changes in earthworks outside the park can alter the natural flow of water within the park, especially in small parks. Invasion by weed species can alter the microenvironment of niches needed for survival of native plants. Storms can bring down trees and as a result, the epiphytes on those trees eventually die. It is the natural order of things for species to die out and become extinct when they can not adapt to changes in their environment, being replaced by other, perhaps newly evolved species which are better adapted to the changed environment.

But is this really conservation of the species we have today? With the small proportion of our continent presently existing in its natural state, should we be preserving the natural environment required by the species, rather than preserving the natural order of things? Should we be putting those fallen epiphytes back up trees rather than letting them die on the ground? Should we be maintaining the environment within the nature reserves by managing the environment around the parks, and even within the parks themselves, in such a manner that serious changes do not occur within the niches needed for survival of all flora and fauna of the park?

The importance of preserving the natural environment for conservation of our native orchids was the theme of a talk given by Geoff Carr at the May meeting of the ANOS Victorian Group. I wish I had been there to hear it, but thank Helene Wild for her notes in the June Bulletin. Conservation seems to be a hot subject in the Victorian Group as evidenced by articles by Phyl Dannatt and John Donovan in the same issue. In this issue of The Orchadian, I have published a letter from Gerald McCraith on the subject of 'Practical conservation with the use of orchid seed'. With so many thoughts and ideas on conservation being discussed in Victoria, surely there is a message that can be put together by a member or members of ANOS Victoria on their philosophy of conservation of the native orchid species of their area. Perhaps a synthesis of the ideas put forward in the June Bulletin could form the basis of an article for The Orchadian. As John Donovan said, we need to ".... advance in a conciliatory, meaningful, purposeful manner after much, much thought and consideration".

But to start, we need a platform, a base, an article to initiate the flow of ideas! Who will begin the discussion?

Noel J. Grundon

FROM THE BACK OF THE BUSHHOUSE – A BICENTENNIAL PERSPECTIVE

Peter B. Adams

67 Banksia Street, HEIDELBERG, Vic. 3084.

This issue takes us to Melbourne where Dr. Peter Adams from the Botany School of the University of Melbourne invites us to look back, during this bicentennial year, at the skills of our early naturalists. Peter himself employs the naturalist traditions of observation, illustration, and description in his studies of the pollination of our native orchids and we will be able to read about some of his observations in the September issue of The Orchadian.

Whatever happened to the Australian naturalist tradition of observation, illustration, and description of flora and fauna ... including indigenous orchids? Botanical exploration in this country began with the scientists and illustrators of Captain James Cook's Endeavour voyage. This was an age where a high value was placed on the study of natural phenomena. The pursuit of astronomical events, new lands, and of plants and animals unknown to science, was considered, along with political objectives, to be worthy of risking expeditions lasting years to uncharted waters on the far side of the world.

Early colonists, many of them with little formal education, continued the tradition with descriptions and illustrations of species found around Port Jackson, or on journeys of exploration to increasingly remote areas. In 1801–4, the Englishman Robert Brown collected and briefly described many orchid species. Ferdinand Bauer produced coloured illustrations of orchids that have never been surpassed. New species were given European generic names such as *Epidendrum* for epiphytes, and *Orchis* for terrestrials; but it was quickly recognized that they bore little resemblance to any orchids in the old world.

Discovery of new species continued apace until the early decades of the twentieth century with observations recorded of pollination mechanisms, natural habitat, variation, and simple cultural experiments like those of R.D. Fitzgerald. New species became more difficult to find and the naturalist tradition declined. The era of intensive scientific exploration of the lives of Australian orchids, which might well have emerged from the tradition, failed to develop, and is only just beginning – unfortunately at the time of a major decline in orchid habitat.

The naturalist tradition of enquiry, as evidenced by printed articles in recent years, is almost extinct. It has been replaced by a current age of orchid societies and shows with priorities of exhibition, prize winning, and attempts to improve on the species. Worthwhile as they may be, these activities do little to advance basic knowledge of declining Australian orchid populations. In the past one hundred years, progress in this area has been slow and we still know little about the majority of the Australian orchid flora.

The Orchadian, Victorian Naturalist, West Australian Naturalist, and several other State based publications, supplied by a small group of contributors, have provided a slender continuing thread of new information in the past fifty years. I hope that there is still a significant group of native orchid enthusiasts who are not simply content with growing and exhibiting their plants, but recognize that there is much more to be discovered about the biology and relationships of our orchids.

There is indeed much more to be done. It would be gratifying to read reports stemming from the "hundreds of good native collections and far more intelligent approach to the hobby" noted by Wal Upton in The Orchadian Vol. 8 p. 254 (1987). Reports of simple experiments with cultural methods for more "difficult" species, pollination attempts, comments on growing in different states, habitat observations, and flowering results in collections, are important contributions to core knowledge, and the enjoyment of other growers. These activities may well be more common than I suspect, but if so, then too few result in publication in The Orchadian.

Non-professional people have an extremely important role to play in increasing our fragmentary knowledge of Australian orchids, but they often feel that their contribution is too minor. After all, there are so many more non-professionals, all equipped with the most sophisticated scientific instrument available – the human eye. Hobbyists and amateur naturalists who do not wish to "go it alone" could contact the increasing number of botanists with an interest in orchids and request to write about their work in collaboration. Cooperative effort would benefit all concerned, especially the readers.

Victoria has a rich terrestrial orchid flora plus five epiphytes which are found mainly at its eastern border. It also has a well established state group of ANOS and many native observers and growers. However, there have been extraordinarily few contributions to The Orchadian from Victorians in the past decade. In the period 1979 to September 1984, only two articles were submitted specifically for The Orchadian, from David Cannon and A.C. Beauglehole. Two brief reports were reprinted from the ANOS Victorian Group Bulletin and there were two brief letters. Since 1984, the only submissions from Victorians are the five from the present author, either as sole author or in collaboration with Dr. S.D. Lawson. This record is surely not representative of the level of interest in native orchids by Victorians.

Current Orchid Studies in Victorian Universities

In the past eight years there has been a resurgence of interest in Australian orchids in Victorian universities. *Dendrobium speciosum* has generated most work, resulting in reports on pollination, breeding systems, responses to fire, and field ecology. The Botany School at the University of Melbourne has several other lines of active research, including the pollination and reproductive biology of *D. kingianum* and other dendrobiums, rare and endangered *Thelymitra* species *Eriochilus cucullatus, Dipodium punctatum,* and *Pterostylis.* For endangered species, a prime objective is to discover effective management strategies to favour survival of these orchids in natural habitats.

Thelymitra *Thelymitra epipactoides* is a rare and endangered species confined mainly to coastal heaths in south eastern Australia. The flowers are polychromatic with red, blue and green in various mixtures. They appear to attract native bee pollinators by fragrance emission and a false promise of nectar. Information about the breeding system and general ecology can be used to manage areas where numbers have become seriously depleted. *T. antennifera* mimics yellow and cream flowering herbs and shrubs which bloom at the same time. It shares with those plants a probable *Lasioglossum* solitary bee pollinator.

Pterostylis Species such as *P. nutans* develop large colonies by vegetative reproduction of tubers with little seed production. Non-colony forming species like *P. longifolia* replace their tubers without increase, and expand numbers by numerous seedlings.

Dendrobium speciosum It is a highly self infertile orchid over the entire distribution range and is almost certainly pollinated by several different species of native bee in different geographical areas. Seed capsule production tends to be low, on account of self infertility and a limited capacity to hold large numbers of seed pods. In East Gippsland, small colonies survived the Ash Wednesday (March 1983) fires, even though plants were burnt to the ground in one of the hottest and most destructive bushfires in two hundred years. The stigma of *D. speciosum* is the first modern example of the wet stigma type with detached cells, first described by Lindley, Bauer, and Brown in the early nineteenth century.

Dendrobium kingianum Multiple pollinators including native and introduced honey bees have recently been confirmed after many unsuccessful attempts to observe a full sequence of pollination. The majority of clones are self infertile accounting for difficulties of breeders in selfing some attractive clones. In contrast to *D. speciosum*, about 20% of clones are self fertile. The project includes study of the evolutionary development of high variability in this species, and interbreeding with other dendrobiums to form natural hybrids.

Reports have been published in the Australian Journal of Botany, Victorian Naturalist, Journal of the Orchid Species Society of Victoria, and also in The Orchadian. Readers interested in these projects may wish to contact Dr. D.M. Calder, Dr. P.B. Adams, A.T. Slater, or R. Watson to either request or contribute information.

The Future

The appointment of Editorial Associates for each state is intended to encourage local contributions to the wider readership of The Orchadian. There are a number of Victorian native orchid enthusiasts who could share their experience and observations with fellow ANOS members. We invite them to submit material to The Orchadian, either directly, or via the Editorial Associate if they require assistance in preparing an article for publication.

Victorians, it is time to demonstrate our active interest in Australian orchids in the pages of The Orchadian!

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DATE CLAIMERS

ANOS Council Seminar

New Guinea Orchids – by Andree Millar
Native Orchid Hybridising – by Walter Upton
Native Terrestrial Orchids – by Ron Tunstall

Date: 10.00 a.m. Sunday, 11 September, 1988.
Venue: Mona Vale Primary School (Corner Waratah & Bungan Streets, Mona Vale).
Cost: $5.00 per person, tickets available at Warringah Group Show.

Orchids of Papua New Guinea

by Rev. Canon Norman Cruttwell

Date: 4 October, 1988.
Venue: Bruno's Conference Centre, Caldwell Ave., Tarrawanna.
Cost: Approx. $5.00 per person to cover supper & hall hire.
Further Details: Contact Ron Wheeldon (042 28 7851)

NZ Native Orchid Weekend

Date: 10-11 December, 1988.
Venue: Invercargill, South Island, New Zealand.

An orchid weekend is planned for the Longwoods area near Invercargill in the far south of New Zealand. About 25 species should be flowering at this time, in a variety of habitats from alpine tussock grassland to clay road verges to beech forest. The weekend will include field trips and formal talks on NZ native orchids.

Further Details: Write to Ian St George, 45 Cargill St., Dunedin, New Zealand.

ANOS Group Shows

Central Coast Group

10 – 11 September, 1988; Gosford Scout Hall, Gertrude Place, Gosford; 'Phone – (043) 67 7694.

Warringah Group

10 – 11 September, 1988; Mona Vale Memorial Hall, Pittwater Rd., Mona Vale; 'Phone – (02) 99 2468.

Native Orchid Society of Toowoomba Inc.

17 – 24 September, 1988; Harristown State High School Assembly Hall, South St., Toowoomba; 'Phone – (076) 35 2570.

Sydney Group Sarcanthinae Show

2 October, 1988; Epping Annex – Ryde School of Horticulture, Chelmsford Ave., Epping; 'Phone – (02) 631 5964.

Woollongong Group

6 – 8 October, 1988; Westfield Shopping Centre, Figtree; 'Phone – (042) 28 7851.

Newcastle Group

8 – 9 October, 1988. Cherry Road Nursery, Cherry Road, Warners Bay.

AN EXPEDITION TO CAPE YORK

Ron E. Wheeldon

227 Mt. Keira Road, Mount Keira

Summary: In October 1985, I, together with three friends, undertook a study of the orchid flora of some areas of Cape York. We equipped ourselves with two four wheel drive vehicles and the necessary gear to negotiate the difficult terrain and set off on 1st October. We chose three areas, Cape York, the Iron Range, and Princess Charlotte Bay. These areas have quite different weather patterns and ecology, and it would be of interest to note the orchid genera endemic to them. A study of weather patterns, light conditions, and elevations would also be undertaken. If time permitted, some energy would be directed towards a study of the history of these areas.

Cape York Study Area

We departed Cairns on the 8th of October en route to Cape York via Cape Tribulation, Bloomfield River, and Cooktown. North from Cooktown via Battle Camp Road and on to Musgrave and Coen where last fuel and provisions were taken on for the final leg to Bamaga, arriving at the Jardine River on the 13th. We made our base camp for this area on the banks of the river. The river had to be forded as the punt had ceased operations for the season. The rugged track and creek crossings had taken their toll. One day was spent effecting repairs to vehicles.

The study area was to be between Punsand Bay and Somerset within the aboriginal reserve of Bamaga. The reserve covers an area of 477,000 ha and is the home of five aboriginal communities totalling 1,800 people. Saibai Islanders were resettled here in 1946 after tidal surges ruined fresh water supplies on their island. Bamaga was named after the then chief of Saibai.

In 1863, John Jardine was appointed as the first Government Resident to the Peninsula. He chose Somerset as the long awaited garrison headquarters, coaling station, and trading post. Somerset was envisaged as a new Singapore. Land was cleared, blocks sold, and streets named. It never transpired but the brave little settlement, in its own way, had a proud place in Australia's history.

It was only fifteen years earlier on 13th December, 1848, that Edmund Kennedy was speared to death by the natives of the Jadhaigana tribe at Escape River. This area is approximately 30 km south of Somerset. In 1869, Frank Jardine took over from his father as Government Resident and was to build a legend in the 50 years he ruled as uncrowned King of the Cape and Torres Strait. Repeated native attacks, supply problems, disgruntled troops, and speared cattle were but a few of his problems.

In 1868, Captain William Banner struck a deal with the legendary Sea Chief, Kebisu, to remove pearl shell from Warrior Reef. It was bringing 150 pounds a ton in Sydney and, by 1876, the price had risen to 400 pounds a ton. Kanakas and Torres Strait Islanders were to become ruthlessly exploited in this trade. Somerset served as a rollicking base for the provisioning of pearlers and relaxation of their crews.

All that remains of Somerset today are the stumps of Jardine's homestead, the coconut palms, and the graves by the shoreline. Jardine, it is said in Aboriginal legend, was buried deep, standing up facing the sea; deep because they hoped he would never return, standing up because they believed he never slept. He died in 1919 at the age of 77 years and is buried here beside the grave of his Samoan bride, Sana. Today an area from Punsand Bay to the tip of Cape York is being developed by Air Queensland as a safari and adventure lodge.

The study area is dissected by the Carnegie Range, the highest point being 109 m. The range is situated in a line between Peak Hill (146 m) in the north-west and Somerset on the east coast. The main water courses are Roonga Creek, flowing west into Endeavour Strait about one and a half km south of Peak Hill, Blackwater Creek, and Big Creek flowing north into Punsand Bay. The Mew River and Barnia Creek flow north-east into Muddy Bay and Shallow Bay respectively just north of Albany Island. In 1848, Edmond Kennedy's ship, the Ariel, lay at anchor in a small bay across Albany Passage. The bones of two of Kennedy's expedition, Wall and Niblett, were buried on the island on 13th May 1849.

The average annual rainfall in the area is about 1652 mm, falling between December and April. The temperature ranges from 25 °C in June/July to 35 °C in December. All streams in the area are intermittent. The elevation of the area ranges from 11 m at Big Creek to 109 m in the Carnegie Range. Large areas of tropical rainforest are a feature of the area. The rainforest is surrounded by areas of closed and open forest. Mangroves occur in small patches at the mouths of most of the streams. Large trees of Black Bean (*Castanospermum australe*) and *Ficus nodosa* are abundant in the rainforest. It was a delight to behold the abundance of strikingly beautiful palms of many different genera that grace these rainforests.

We found *Dendrobium bifalce* to be most abundant in open forest areas and also high in rainforest trees, always growing in situations with bright light. *D. smillieae* was another prevalent species and some very beautiful pink specimens were seen. A feature of this species is its preference for the fork of the limbs of trees where moisture and organic matter gathers from whence it draws its nutrient. Its light requirements are not so specific and it grows in all situations from high-light open forest to low-light rainforest areas. Humid creek areas and limbs overhanging water were preferred situations. *D. trilamellatum* (syn. *D. semifuscum*), *D. canaliculatum*, and *D. johannis* were found only in open forest high-light areas, growing on *Melaleuca* trees.

In one area near Punsand Bay, we found *Diplocaulobium glabrum* growing in a dry situation almost covering the trunks of some of the *Melaleuca* trees. *Bulbophyllum baileyi* was mainly a rainforest species with some large specimens almost covering the trunks of their hosts. Light requirements were of medium intensity. Our most rewarding find in this area was in a dry watercourse south of Peak Hill. This creek empties into Roonga Creek. On the edge of rainforest bordering open forest, we found *Pomatocalpa macphersonii, Chiloschista phyllorhiza, Schoenorchis densiflora*, and *Eria inornata* growing in poor light in the creek bed, with *Pholidota pallida, D. smillieae*, and small specimens of *D. bifalce* close by.

We searched an area around Somerset but found no orchids anywhere near the ruins of Jardine's homestead. Further afield towards the Carnegie Range in open forest, *D. smillieae* and *D. johannis* were abundant with a few *D. bifalce*. *Luisia teretifolia*, an uncommon species, was also found in the area. Just north of Jacky Jacky Creek, we found *D. trilamellatum* with large strikingly beautiful yellow flowers, growing on *Melaleuca* trees. The intense light also suited *D. rigidum*.

Iron Range Study Area

Our next study area was the Iron Range between Tozer's Gap in the west and Portland Roads in the north-east. The area is a true wilderness of worldwide significance containing the largest area of lowland rainforest in Australia as well as open forest. The animal and plant communities contain species as yet unnamed. The area marks the southern limit for the distribution of animals and plants also found in Papua New Guinea, such as the Spotted Cuscus, Refescent Bandicoot, Palm Cockatoo, Eclectus Parrot, and Green Python. Botanicals such as the insect eating Pitcher Plant (*Nepenthes mirabilis*), Nypa Palm, and over fifty species of orchids also occur.

In November 1848, Edmund Kennedy's expedition hacked their way through this area, taking eleven days to penetrate fifteen miles. On 11th November, he made a base camp on Little Bald Hill some seven miles north-west of Portland Roads. He left eight of his party at this camp as they were too weak to proceed further. Many landmarks in the area are named after members of the expedition; Kennedy Hill, Carron Hill, Carron Valley, Huxley Hill, Wall Hill, and Goddard Hills are features north of the Pascoe River. *D. carronii* was named after botanist William Carron, one of the two survivors of the Little Bald Hill camp. Today a monument stands on the foreshores at Portland Roads to commemorate Edmund Kennedy's expedition and the nine men who lost their lives with him. Six of these died at Little Bald Hill camp.

During the last war, Iron Range airstrip and Portland Roads were bases for the many Australian and American servicemen serving in the area. The airstrip is still in use today mainly to service the aboriginal community of Lockhart River to the south-east. Portland Roads is a small community of approximately 20 people living in retirement or alternative lifestyle, and all that remains of the wartime fixtures are the foundations of the burnt out wharf and thousands of rusting petrol drums slowly being covered by forest re-growth. A gold exploration team of about 20 men is at present in the area near Lamond Hill in the Iron Range.

The study area is mainly lowland rainforest dissected by patches of open forest. The elevation is generally 40 m to 60 m, with Lamond Hill (191 m) and Ham Hill (115 m) in the east, Mount Tozer in the west (543 m), and North Pap (400 m) to the north-west. The main watercourse is the Claudie River flowing into Lloyd Bay five km north of the Lockhart River. Other substantial streams are the Middle Claudie River, Scrubby Creek, and Gordon Creek, all flowing into Claudie River.

Rainfall for the area averages 2047 mm annually, falling mainly between December and April. The average for the period May to November is 268 mm.

Unlike inland areas, some coastal showers fall during the "Dry". Temperatures for the area range from a low 18 °C in June/July to 35 °C in November to February with relative humidity up to 90%.

Our base camp was on the Middle Claudie River. We studied an area some 5 km up-stream and about 3 km down-stream from our camp. This area was dense rainforest with some thick stands of "Wait a While" Palms and Lawyer vine (*Calamus* sp.) making it virtually impenetrable. We observed *Robiquetia tierneyana, Cadetia maideniana, Robiquetia wassellii, Sarcochilus moorei, Pomatocalpa macphersonii, Pholidota pallida*, and *Taeniophyllum glandulosum* growing on rainforest trees close to water in poor light conditions. High up in the trees we observed *D. discolor, D. smillieae, D. bifalce*, and *D. luteocilium*. While examining a specimen of *Taeniophyllum glandulosum*, I failed to notice a nest of small black wasps in close proximity. I very quickly lost interest in the orchid and for the rest of the day nursed badly punctured arms and neck. Another feature of this area was the Tassel Ferns (*Lycopodium phlegmaria* and *L. proliferum*) high on the trees near the watercourse.

The study area on 24th October, 1985, was located from Claudie Falls west to Garraway Creek. Elevation was from 50 to 100 m. The habitat of the area ranged from rainforest to open *Melaleuca* forest. *D. trilamellatum* was an abundant species growing on *Melaleuca* trees in open forest conditions in very bright light. We found some beautiful specimens with flowers to 55 mm long with light brown to yellow petals and large golden yellow labellum. We also found one specimen with dark brown, almost black flowers and small labellum which was quite a contrast. We searched for some time to find another, but in vain.

Some distance further on we found *D. carronii* growing on *Melaleuca* trees in a swampy area. Although pigs had been active in the area, a large colony of *Bromheadia pulchra* were found undisturbed and in flower. The 33 mm flowers are short lived but most appealing with their lilac sepals, white petals, and yellow labellum – quite a rewarding find. Near a watercourse we found *Acriopsis javanica* var. *nelsoniana* together with *Eria inornata. Dischidia nummularia* was also draped over the limbs like a beautiful shawl, its grey beads hanging down some 120 cm. *D. canaliculatum* was also quite an abundant species in most areas of open *Melaleuca* forests particularly in low or swampy areas. We were most fortunate to find one specimen with yellow concolour flowers. The Ant Plant (*Myrmecodia platyea*) was abundant in this area.

We returned to the Claudie River west of the Claudie Falls. This rainforest area had an elevation of about 40 m. At the head of a small gully we found a colony of *Sarcochilus moorei.* Almost every tree was host to numerous plants, from seedlings to huge specimens and with leaves 300 mm x 60 mm and inflorescences 60 cm long – a most rewarding sight. In the same area was *Pomatocalpa macphersonii* and *Robiquetia tierneyana.* In this area the air movement was good, rising from a creek below, and the light was medium. About 50 m away, high in the trees, *Micropera fasciculata* was growing happily with *D. bifalce, D. smillieae*, and *D. luteocilium* nearby. *D. teretifolium* var. *fasciculatum* was also abundant in some areas. Near the river some good specimens of Tassel Fern (*Lycopodium phlegmaria*) were observed.

Princess Charlotte Bay Study Area

After leaving the Iron Range on 29th of October, we made our way to Musgrave Station and from there on to Lakefields National Park to study an area around the Annie River. The park is 528,000 ha in size and is the largest single area of National Park in Queensland. Its open grassland plains dotted with enormous ant hills, lazy rivers, and spectacular lagoons provide an ideal environment for the many forms of animal and bird life abounding here with Brolgas, Jabiny storks (policeman birds), parrots, ducks, geese, eagles, kangaroos, wallabies, dingoes, crocodiles, and many others; it was truly a biologist's dream.

The study area was north of Five Mile Creek and east of the Annie River to the shores of Princess Charlotte Bay. Elevation in the area is from 4 m to 8 m. Most of the area floods during the wet season and all roads are closed from December to May. Water courses are all tidal. Temperature range is from 18 °C to 40 °C with an annual rainfall around 1070 mm. There are large areas of grasslands with clumps of *Melaleuca viridiflora* in abundance. The water courses are mainly lined with *Eucalyptus tessellaris, Melaleuca viridiflora*, and mangroves. Large salt pans are a feature of the area, dotted with the gaunt shapes of dead trees in and around them. Even on these trees and in what must be extreme conditions, *D. trilamellatum* continues to grow and flower.

We made our base camp at Saltwater Creek not far from Low Lake, an intermittent lake containing fresh water and much weed growth. It attracted thousands of birds – Burdekin ducks, Teal ducks, Magpie Geese, Curlews and many more. We drove to the Annie River on 30th of October to examine the trees along the watercourse and those in close proximity to it. *D. trilamellatum* was most abundant in this area, some trees being host to eight or nine specimens. Almost every tree carried some orchids. *D. canaliculatum* was also abundant in patches of *Melaleuca* trees some distance from the river, always with good bright light. In one area towards Lily Vale, we found a colony where almost every tree was a mass of yellow bloom.

We continued our trek north-east towards Princess Charlotte Bay, passing through mixed open forest and on to dry salt pans. Here again *D. trilamellatum* was fairly abundant, growing on the dead trees in very harsh conditions. Few specimens of *D. canaliculatum* were seen in this area. We now struck north away from the salt pans to an area of dry monsoon forest with many deciduous trees. It was in this area we found our first *D. bigibbum* growing on a *Melaleuca* tree together with a number of *D. trilamellatum*, the latter being the dominant species. *D. johannis* was also abundant in this area. From here to the shores of the bay was mainly open grasslands. Some large areas were devoid of trees until near the shores where mangroves were the dominant species. The "beaches" proved to be mudflats much to the dismay of some of our party who stepped into the slimy mud which at first sight looked solid. We reached the coast about fourteen km north-west of the Kennedy River where fishermen had made a depot for fishing the Bay and its numerous creeks. They transport their catch by four wheel drive vehicles to Cooktown and Cairns.

Our next study area was the Normanby River at Orange Plains. Having left camp at Saltwater Creek on 31st of October, we crossed the stream and proceeded through Nifold Plain, a very flat grassland dotted with large ant hills and devoid of trees almost to the Kennedy River. The elevation from here is 1 m to 4 m and the area is quite impassable once the rains commence. *Melaleuca* trees began to appear and increased in size as we approached the Moorehead River. On the other side of this stream, the vegetation changed again with some *Eucalyptus* emerging and *Cymbidium canaliculatum* var. *sparksii* the only orchid seen. In some of the dry watercourses, groves of palms, *Livistona murellai* and *L. berthami*, were present.

After crossing the Kennedy River at Hann Crossing, we explored the banks of the river for some distance. We found *D. canaliculatum* growing on large *Melaleuca* trees overhanging the water. Some large specimens were seen with pseudobulbs 30 mm in diameter and flowers 25 mm in diameter – very vigorous plants.

After leaving the Kennedy River, we proceeded to Bizant Ranger Station to consult Ron Stannard, the local Ranger regarding the Orange Plains area. From here we drove on to the Normanby River where we camped. We studied an area following the river for about 10 km and about 1 km wide. There were patches of "dry" rainforest along the river. Away from the influence of the river, *Melaleuca* and *Eucalyptus* were dominant trees with the unusual Palm, *Corypha elata*, also present. This palm takes approximately 130 years to flower and produce seed, at which time it loses all its fronds and produces a complete head of flowers which in turn form thousands of seeds. When these mature the palm dies.

D. trilamellatum was again the most dominant orchid growing on every type of tree from *Melaleuca* to *Eucalyptus*. *D. canaliculatum* was also abundant on the *Melaleuca* trees. It was most interesting to find a natural cross between the two orchids. Four specimens were found growing on *Melaleuca* trees. The only other orchid found in this area was *Cymbidium canaliculatum* growing in trees near the river.

Conclusions

Although the three areas differ greatly in weather pattern, climatic conditions and physical make up, some orchids are quite abundant in all areas. *D. trilamellatum*, D. johannis, and *D. canaliculatum* were orchids of the more open areas and over the centuries have evolved to withstand the extreme conditions of light and temperatures of these areas.

The rainforests provided a protected environment for a number of orchids such as *Sarcochilus moorei, Schoenorchis densiflora, Pomatocalpa macphersonii, Robiquetia tierneyana,* and *Taeniophyllum glandulosum*. These orchids require low light with damp humid conditions which are in direct contrast to those required by the dendrobiums named above. The most widespread species was *D. smillieae* which we found growing in all types of environments from Daintree to Cape York.

ORCHIDS OF MOUNT GAHAVISUKA – PART ONE: *BULBOPHYLLUM*

Norman E.G. Cruttwell

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MOUNT GAHAVISUKA: A thousand metres above Goroka in the Eastern Highlands of Papua New Guinea (P.N.G.), on one of the spurs of Mount Otto, lies a nature reserve and botanical sanctuary known as Mt. Gahavisuka Provincial Park. It is not very large (77.4 hectares), but it is in an area of beautiful natural mid-montane rainforest with magnificent views of the Asaro Valley and surrounding mountains, including Mt. Wilhelm on a clear day.

Within the Park is the Lipizauga Botanical Sanctuary, a kind of botanical garden for the conservation and cultivation of native flora from all over the highlands of P.N.G. The garden is integrated into the bush, rather on the lines of the Pukeiti Rhododendron Trust in New Zealand.

We grow all kinds of plants, common and rare, ornamental and inconspicuous, with the idea of conservation and eventually propagation. Our specialities are rhododendrons and orchids. We grow them for study and identification as well as for observation by visitors, both nature-loving and scientific, and as an educational project for schools, colleges, and the University. We have had many visitors from all these categories, including many from overseas, in the four years since our establishment.

We are in the process of joining the I.U.C.N. Botanic Gardens Secretariat and will be supplying information for their International Data Base. Our aim is to keep and maintain a comprehensive collection of highland native species to preserve them from destruction by timber, agricultural, and mining projects. Such a programme is essential at several altitudinal levels if the unique resources of the P.N.G. flora are not to be lost. It is estimated that no less than 90% of this flora is endemic. The percentage would be even higher in the highlands.

The Highland Orchid collection at Laiagam is a similar project but for orchids only. However, it has lost its scientific basis with the departure of Tom Reeve. As far as I know, Mt. Gahavisuka is the only viable one at present.

After that preliminary diversion, I must get down to the nitty gritty, if such a term can be applied to such delicate creatures as orchids. Within the Sanctuary are two bushhouses where orchids and other plants can be concentrated, cared for, and observed. In addition, many have been attached to trees and planted in the ground outside the bushhouses to augment the abundant natural flora which was there before we began and which extends all through the Park.

The Beautiful Ones

The major orchid genus in the Park is undoubtedly *Bulbophyllum.* There is an almost infinite variety of these, from the minute and delicate to quite large-flowered species. Even the latter, such as *B. pulchrum*, *B. nitidum*, and *B. speciosum*, have a delicacy which is absent from some of the coarser-flowered lowland species.

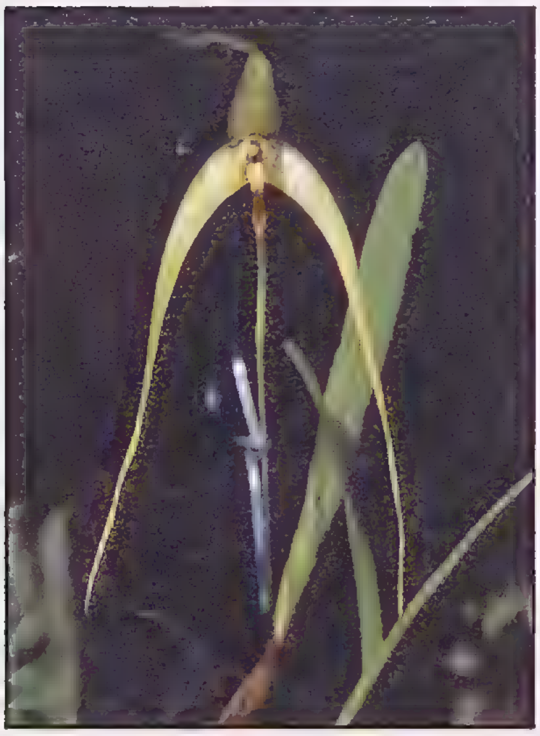
B. pulchrum (Fig. 6) is abundant in the Park and certainly lives up to its name, 'beautiful', bestowed on it by the famous explorer botanist, Dr. Rudolph Schlechter. Its flowers are wide but slender, attaining some 10 cm in diameter. The spreading sepals are white with various amounts of purple banding, and the fleshy spindle-shaped labellum has a ground colour of yellow, overlaid with dense purple spotting.

B. nitidum is similar but somewhat smaller, the lip white in the centre with deep purple margins, whereas *B. speciosum*, the rarest of the three, has a golden labellum with a white tip. These three all have minute membranous petals and a hook-shaped column with stelidia, characteristic of the subgenus *Hapalochilus* into which Schlechter places them. The fleshy labellum is often eaten by insects, and I suspect that this is its purpose to ensure pollination.

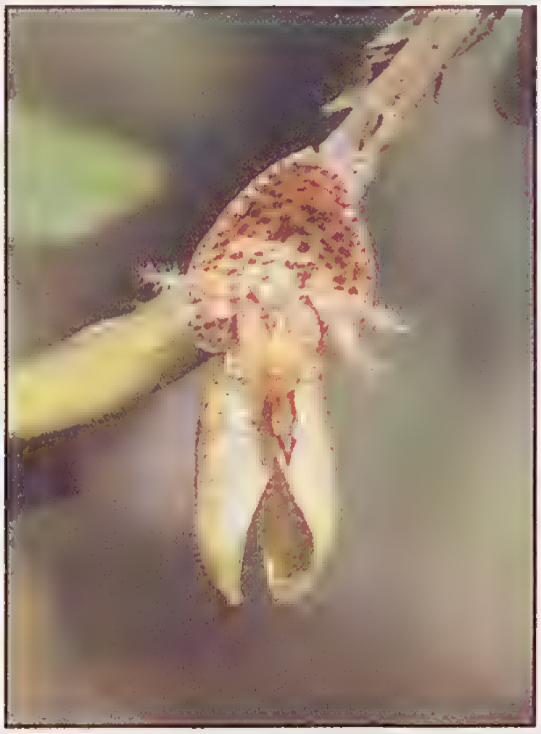
A 'Weirdy'

Some of the *Bulbophyllum* have flowers of the weirdest aspect. One of the most spectacular of these is *B. trachyanthum (section Hyalosema*) (Fig. 3), a common species in the Park. The flowers are quite variable but basically have three long greenish yellow, purple-flecked erect sepals, the dorsal one often extremely long while the lateral sepals are twisted spirally with up to three turns. The petals are extremely thin and rod-like. The total effect is very bizarre.

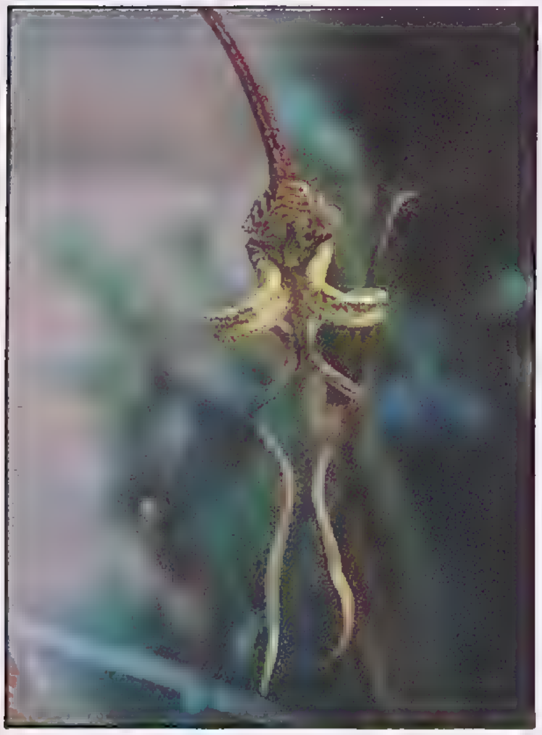
Bulbophyllum species of Mt Gahavisuka - by Norman E.G. Cruttwell



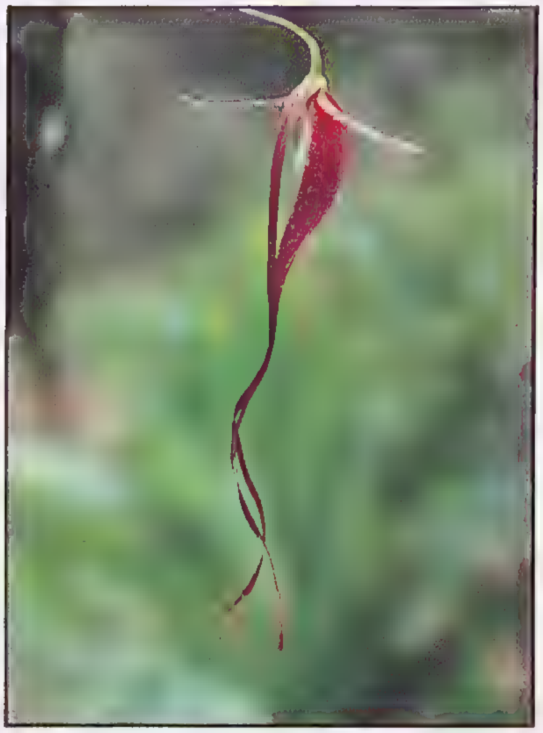
Bulbophyllum sp.
Section *Ephippium* - 3000m



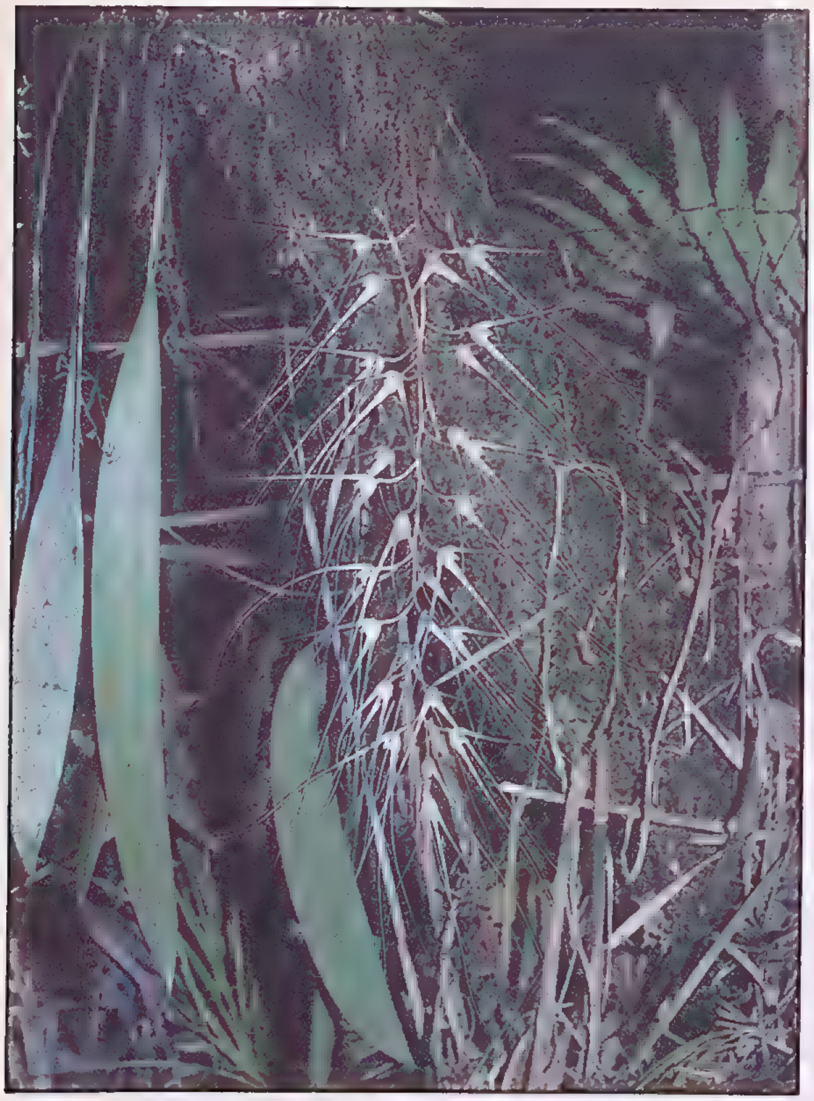
Bulbophyllum trirhopalon Schltr.
Section *Polyrhopalon* - 2250m



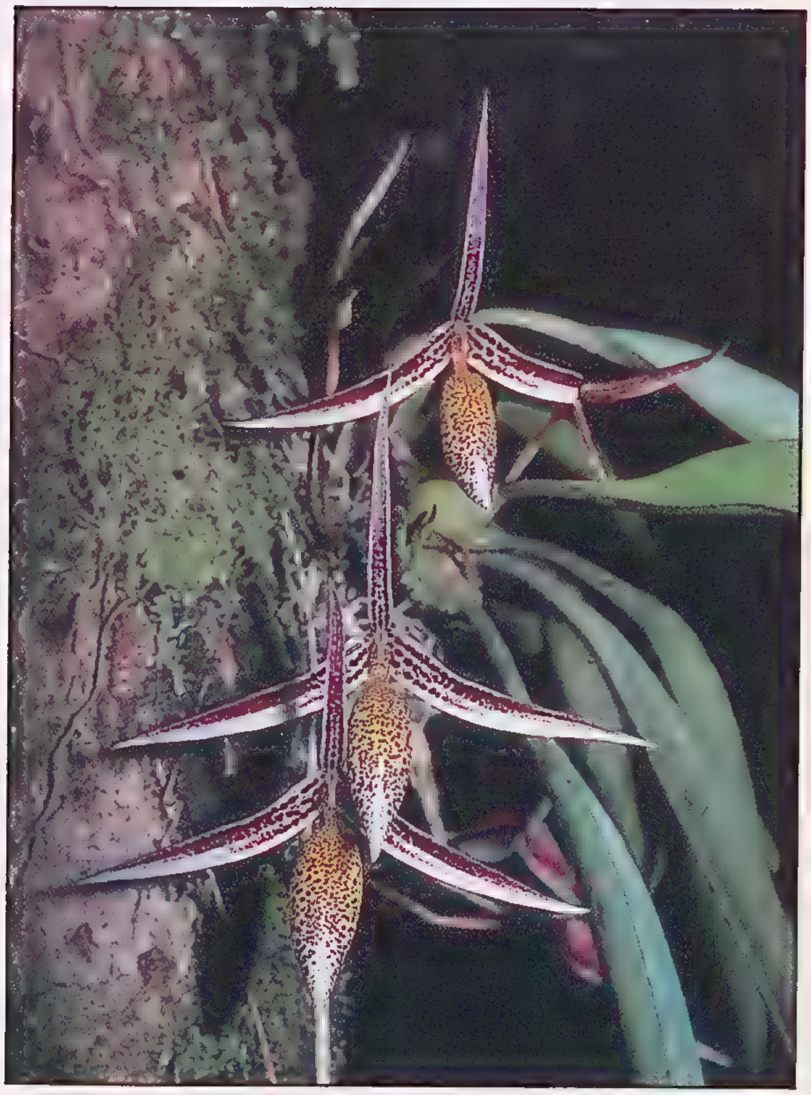
Bulbophyllum trachyanthum Krzl.
Section *Hyalosema* - 2000m



Bulbophyllum masonii Schoser
Section *Polyblepharon* - 2250m



Bulbophyllum sp. (Bottlebrush type)
Section *Macrouris* - 2500m



Bulbophyllum pulchrum Schltr.
Section *Coelochilus* - 2250m

There are several other highland species in this section which do not have the twisted sepals, but instead have very long arching sepals, the lower pair adnate, giving the effect of a long curved open bird-beak (like Meyer's Sickle-bill Bird of Paradise, which also occurs in our Park). Examples of these are *B. biantennatum* and the very large *B. elephantinum*. The giant lowland *B. grandiflorum* also belongs to this section.

Two of the Finest

Perhaps the most magnificent highland *Bulbophyllum* is a species from the Enga Province (Fig. 1). It has perhaps the largest flower in the genus (in P.N.G.), namely 20 cm from top to bottom and nearly as wide and of a beautiful shade of soft clear yellow. The sepals are extremely long and tapering. As in most *Bulbophyllum*, the petals are small and inconspicuous, giving the flower a tripartite appearance. It grows high on *Nothofagus* trees at 3000 m in the Enga Province and has not yet been named. It belongs to the section *Ephippium*. It is a shy flowerer in cultivation but flowers profusely in its natural habitat.

In the section *Peltopus* is a charming species called *B. rhodoleucum*, with smaller but abundant flowers with white, purple-lined sepals and a bright magenta shield-shaped labellum. It is often a lithophyte as well as an epiphyte. It is common at Daulo Pass at 2500 m.

Bulbophyllum masonii

One of the most remarkable of the montane rainforest *Bulbophyllum* is *B. masonii* (section *Polyblepharon*) (Fig. 4). When not in flower, it is most inconspicuous with a small tuft of reddish leaves, usually on a thin twig. The flower is three or four times as long as the foliage and hangs down like a long maroon banner, reaching some 15 cm in length. The two lateral sepals are fused into a long strip with two points, the labellum is like a purple feather, and the petals are narrow with filamentous hairs. It is named after Maurice Mason, a well-known plant-man in England. We found it together at Daulo when Maurice visited us a few years ago. It is common in the Park but not often observed.

Fusing of the two lateral sepals occurs in a number of species. Another is the strange *B. leariflorum* in which the 'two' yellow sepals are in a straight line with the two very short purple petals at right angles, making a narrow linear cross.

Pendulous Species

Many *Bulbophyllum* are pendulous, often reaching a metre long. The flowers are on a smaller scale, but often very numerous and in a range of colours. The foliage may be narrow or broad, and usually makes an interesting pattern as the leaves orient themselves about the often branching stems to catch the light. The whole effect is a sort of ornamental tassel, like a complicated piece of macrame.

One which is common in the Park has purple, yellow or white flowers in short racemes. Another has terete leaves for all the world like a pencil orchid, with feathery white flowers. Others have flowers like little hovering bees, either dark red or golden yellow (two distinct species).

In another species, the leaves are cordate, bright apple green in colour, and stand out horizontally from the stem. The flowers are minute, tripartite, and translucent with incurved sepal tips. Under the lens, it looks like pale green glass. It is probably a new species.

An Insect in the Flower? Perhaps the most remarkable of the pendulous *Bulbophyllum* is *B. trirhopalon* Schlechter (Fig. 2) which makes an intricate descending cone of branches with cordate succulent leaves and the most bizarre flowers. The three fleshy sepals are pale green with some purple speckling, and the small labellum purple. The petals are provided with three sausage-like appendages which are attached by hair-fine threads and are therefore mobile, vibrating in the lightest air current. They give the appearance of a six-legged insect sitting in the middle of the flower and wriggling its legs. One is tempted to believe that this is a device to attract insects to pollinate the flower by sexual attraction as is done by the genus *Ophrys* in Europe and perhaps some Australian orchids.

Creepers

Many *Bulbophyllum* are extensively creeping, some forming long strings up the trunk of a tree and others making dense or loose mats. One of the creeping species (section *Manobulbon*) has racemes of dark purple flowers rather like a lot of little birds on a perch. We have only found this at the foot of Mt. Michael. Another rather similar species, but from a different section, is *B. hedyothyrsus* which we collected from Kassam Pass and whose flowers are quite large and pink and yellow in colour.

The most unusual of the creeping species is one which I call the 'bottlebrush orchid' (Fig. 5). It is indigenous in the Park, and, like *Cattleya citrina*, always grows on the underside of a branch. Its long petiolate leaves hang vertically downwards. The inflorescence is a long pendulous raceme of extremely slender flowers with thread-like sepals some 12 cm long. They are translucent white with a central red line. The total effect is of a soft pink bottlebrush or feather duster. It is very striking and beautiful. It belongs to the section *Macrouris* and as far as I know has not yet been named.

Miniatures

Before I leave the genus *Bulbophyllum*, I must mention some of the miniatures. There seems to be an almost endless variety of these, loosely or densely creeping, or in little tufts, with minute bead-like pseudodulbs and leaves from orbicular to linear in shape, only a centimetre or two long, and with tiny flowers on thread-like stems. These are usually borne singly or in few-flowered racemes, translucent and incredibly delicate, usually white or purple and often exquisitely patterned and lined.

Some have mobile feathery labellums (section *Polyblepharon*) which vibrate with every air current. One, *B. tentaculiferum*, looks just like a mosquito, and another, *B. antennatum*, like a fly. Another, *B. bivalve*, is more like a dark, almost black moth. In one (unidentified), the flower is almost completely transparent, like colourless glass with black lines etched upon it. These miniatures usually grow on mossy tree trunks in the dense forest. One needs a 10X hand lens to appreciate their exquisite beauty which, to my mind, often exceeds that of their larger relatives.

Bulbophyllum Relatives

There are several genera closely related to *Bulbophyllum* which I think should be included in this article. The first is *Pedilochilus* which has the habit of *Bulbophyllum* but the labellum is slipper-shaped, rather like a minute *Pahiopedilum.* These are fairly common in the montane forests and even extend right up into the alpine grasslands. They have curious petals which lie flat on the labellum and curve around like the cells of a stomate, leaving only a small opening for an insect to go inside. Later, it appears that they wither, allowing the insect, having done its work of pollination, to escape. The flowers are usually small and densely purple speckled, but a species from Mount Michael has quite large yellow flowers. One which grows on tree fern stems on Mt. Wilhelm at 3500 m has wide flowers of a beautiful shade of golden yellow.

Another attractive genus is *Saccoglossum* of which *S. papuana* is common in the Park. This too has an open sack-like labellum and the curious property of producing little plantlets all along the roots. Some species have purple dotting all over the underside of the leaves which are complanate; the small flowers are pink to dark red in colour.

The Weirdest of All I have kept an orchid from the genus *Monosepalum* to the last. This extraordinary orchid has the habit of a creeping *Bulbophyllum*, except that its pseudobulbs are almost nonexistent and its leaves fleshy and obviously water-storing. It grows in deep humid forest in our Park at an altitude of 2000 to 2500 m. The single bizarre flower arises from the base of a leaf on an erect purplish hairy stem from which it hangs vertically downwards to a length of perhaps 15 cm. All three sepals are fused into a long wide ribbon, separating about two thirds of the way down into three points. The colour is greenish with pink to purple flushing and streaking. The labellum is small and fleshy.

The petals have three long unequal fusiform appendages, like fingers of a dark red hue. Not only are they pivoted on slender hairs, but the whole flower, hooded at the top by the infolding of the sepal strip, pivots at the top so that it can rotate either way in a horizontal direction. When it does this, the finger-like appendages on the petals are caused to roll up and down, which makes them appear to wriggle, like the legs of an insect. It even beats *B. trirhopalon* in its ingenuity. Two species of *Monosepalum* are described in Schlechter, but ours does not seem to fit either of them.

Conclusion

With this I leave this fascinating and little known group of orchids which need and would well repay further study. There are a few botanists working on the genus, but it is so vast, that no one person can cope with all of them.

Much work is being done on them at Leiden in Holland and a Dutch Collector, Mr. Peter Jongejan, has been out here a number of times to collect specimens for cultivation and study in the Netherlands. He is building up a unique and marvelous collection of close-up stereo photographs of P.N.G. *Bulbophyllum*, copies of which are kept at Lae.

The genus has been largely neglected in cultivation in Australia, although Mr G. Stocker of Malanda, N.Q., has a very fine collection. The highland orchids of P.N.G. in general are little known outside this country and yet contain many of the most beautiful and fascinating species.

READERS' FORUM

PRACTICAL CONSERVATION WITH THE USE OF ORCHID SEED

The importation of orchid species is becoming more difficult and expensive because of various forms of legislation, and depredation of the natural habitat, and the awareness of many countries for the conservation of their natural heritage of their orchid species.

The question of conservation of the orchid species in Australia is very familiar to orchid enthusiasts, and while we have many successful species, that is, their habitat is wide spread, there are a number of species whose future is very fragile, because of the specific nature of the habitat in small pockets, or the safety of that habitat presently depending isolation and remoteness.

The A.O.F. Orchid Species Seed Bank was created because it was believed to be one of the more practical avenues of conservation and every effort should be explored that will encourage the commercial orchid nurseries to raise some orchid species from seed, and ideally, for that Nursery to promote their sales as "Nursery raised species".

Being practical, the commercial grower would be very interested in those species which may be termed 'very desirable' if that seed is available.

The main purpose of this preamble, is to emphasise that there is an urgent need for the seed of these desirable species to the amateur, as well as the commercial grower.

The AOF Orchid Species Seed Bank seeks your co-operation to encourage your friends to 'self' a few of these flowers as they come into flower. It is appreciated that the seed cannot be produced overnight. Many of the epiphytes will take 9 to 10 months to mature, and while many talk nonsense about conservation, here is a chance for you to do something really positive from the enormous number of very attractive species that have been imported into Australia in the past decades.

A number of Members of the AOF have been regularly supplying seed, both native and exotic, to the AOF Orchid Species Seed Bank to their credit, making a creditable good list of the seed available, and this segment of the Foundation is attracting more and more attention from overseas orchid enthusiasts which helps to make our efforts more encouraging.

It is the desire of the Foundation to enlarge this list of seed being available, hence this appeal to YOU personally. Dry seed, rather than green pods is being sought to enlarge the number of species available.

Let me repeat, that while seed from you will be most acceptable, it will be more wonderful if you can encourage your friends to join our contribution of PRACTICAL CONSERVATION of the orchid species.

Send seed, and all enquiries for seed to: Erhard Husted, 81 Darvall Rd., West Ryde, NSW 2114.

In appreciation of your attention,
Gerald Mc Craith,
107 Roberts Street, ESSENDON, Victoria 3040.

REQUEST FOR INFORMATION

Dendrobium X *suffusum*

I am researching the natural occurrence of *Dendrobium* X *suffusum*. There are three reasons why I am doing this. The first will be to satisfy the requirement for the forthcoming ANOS Judging Course to submit a paper on some aspect of orchidology. The second because it would be a paper suitable for publication in The Orchadian. Last but not least, we all have favorites and *D.* X *suffusum* is mine, so it will be a good opportunity to learn more about the beast.

I have identified about 30 separate clones so far through my own efforts, but would now like to cast my information net widely and now seek assistance from readers of The Orchadian. If you have any natural clones of *D.* X *suffusum*, or know of any details of its collection in the wild, I would be pleased to hear from you. Please contact me at the address below.

Yours sincerely,
Darryl Smedley,
25 B Railway Street, Baulkham Hills, NSW 2153.

READER'S FORUM is set aside for comments from the readers of The Orchadian. If you have a short statement you wish to make regarding an article which has appeared or about comments made by another reader, *READER'S FORUM* is the place to make it. Comments for inclusion in the *READER'S FORUM* are always welcome and should be forwarded to:

READER'S FORUM, ANOS, P.O. Box C106, Clarence Street, Sydney, N.S.W. 2000.

BOOK REVIEW

VICTORIAN ORCHIDS IN HABITAT

By Margaret E. Dacy. 272 x 209 mm., 224 pages, soft cover, 289 colour plates, many line drawings. Printed by Brown Prior Anderson, Burwood, Melbourne, No Publishing Date given. Price $37.00 Australia.

This is the first attempt at a complete field guide to the Victorian orchid flora since "Victorian Native Orchids" Vols. 1 & 2 by C.E. Gray, 1966 and 1971 (Longman). Much has happened in the intervening 20 years. New species have been discovered, "extinct" species have been rediscovered, and reclassifications have led to many name changes and taxa being raised to species level. This has come about largely as a result of the enormous growth in popularity of our native orchids in recent years and the many dedicated people, both amateurs and professionals, looking more closely than ever before at these intriguing plants.

The author of this present volume has not come to grips with the current status and nomenclature of many of the orchid taxa present in Victoria. Some recent name changes have been included but the species are inexplicably arranged alphabetically by the old names, the new ones seemingly added as an afterthought. The author would appear to be unclear as to which taxa the names *Pterostylis rufa, P. pusilla, P. mitchellii, P. acuminata, Caladenia toxochila, Thelymitra aristata* and *T. nuda* currently apply. Reading these plant descriptions and looking at the relevant photographs is bound to lead to confusion.

Some recent additions to the Victorian orchid flora, *Pterostylis laxa, P. aestiva, P. coccinea, Corybas hispidus* and *Dipodium hamiltonianum*, have been included. Other species such as *Caladenia praecox, C. pumila, C. leptochila, Corybas despectans, Prasophyllum diversiflorum, P. subbisectum, P. pallidum, P. rogersii*, and many others, have not even been mentioned. Brief mention has been made of *Prasophyllum rufum, Pterostylis hamata* and *Pterostylis pusilla*, but these have not been described fully.

The text is written in a very confusing style and is full of errors, both factual and typographical. An incredible sentence in the preface is indicative of much of what follows. "For example, *Melaleuca* thickets and the lizard orchid are associated in the Otways; *Pterostylis tenuissima* grows near *Melaleuca* – edged creeks, while tongue orchids and swamps are some associations." *Pterostylis tenuissima* is generally associated with *Leptospermum lanigerum* not *Melaleuca* species. This is stated correctly later in the book (page 148). Many times we find the words species and genus used interchangeably (pp. XV, 50, 55, 58, 77, 106 and 147). We find the words growth and growing used where clearly flowering is meant (pp. 55 and 76). Species is used instead of specimen on page 82. There are many more mistakes of this type as well as other inaccuracies. It is stated on page 32 that *Calochilus richae* "... was found near Rushworth in 1923 by Mrs. E. Coleman ...". This orchid was, in fact, found by Mrs. E. Rich in 1928. *Pterostylis alveata* is said to grow "... in Victorian mountainous districts ..." (page 108), it is confined to near coastal areas. *Thelymitra mucida* is described as having "closed flowers", they do open on warm, humid days. It is stated on page 151 that one of the three species in the genus *Arthrochilus* (there are at least four) is endemic to Western Australia. No *Arthrochilus* species occur in W.A.; it is a *Spiculaea*. These, and many other, mistakes could have been eliminated had the manuscript been checked by someone with expertise in this field.

There are some 64 pages of colour plates in groups, usually of eight pages, spread evenly throughout the book. These photographs are mainly close-ups of orchid flowers but there are some of orchid habitats, whole plants in-situ, leaves and pollinators. The quality of many of the slides and/or their reproduction is quite poor. Some are out of focus, under-exposed or over-exposed. Some of the flowers are long finished, have their labella up (e.g. *Pterostylis cycnocephala* on page 117) or have been torn apart in an attempt to reveal the column. The habitat plates are too small to be of much use, and that of *Dendrobium striolatum* on page 63 is likely to be misleading. It shows a grassy foreground with a river valley in the distance; not a single rock outcrop is visible. The printers have slotted some of the plates in sideways and, inevitably, a *Prasophyllum (flavum)* has been put in upside-down.

The copious line drawings and captions are generally quite useful. The plant descriptions are thorough and usually accurate. It is a pity that there is no cross-referencing between the plant descriptions and the colour plates and line drawings except via the index. The habitat and distribution data, given before each plant description, is very meagre and sometimes out of date or inaccurate.

I am unable to recommend this book either to the novice or the seasoned orchid enthusiast. It contains far too many mistakes, uses an obsolete nomenclature, is written in confusing, often ambiguous, style and leaves out too many species, some of them being reasonably common in Victoria. Mercifully it has been produced in very limited numbers and there is some hope that the manuscript can be overhauled before thought is given to a second printing. It is also unforgivable of the printers not to include a printing date on this type of publication. I believe it appeared on the scene in the latter half of 1987.

Jeff Jeanes

BOOK REVIEW

A CHECKLIST OF AUSTRALIAN NATIVE ORCHID HYBRIDS: 4TH EDITION – JULY 1988

Published by The Council of the Australasian Native Orchid Society. 208 x 148 mm., 52 pages, soft cover. I.S.B.N. 0 – 9589429 – 1 – 9. Published July, 1988. Price $3.50 plus postage and handling.

This publication contains the names of all Australian native orchid hybrids registered with the Royal Horticultural Society as the International Registration Authority for Orchid Hybrids, up to and including March 1988. As such, it is the most authoritative, up to date listing of these orchids and is a must for all serious growers of Australian native orchid hybrids.

The Checklist was prepared and compiled under the direction of the ANOS Nomenclature and Registration Subcommittee, the Editorial Committee comprising Mark and Allison Webb, Michael Harrison, and Murray Corrigan, with Sid Batchelor acting as Special Editorial Advisor.

This 4th Edition of the Checklist represents a complete revision of earlier editions. With the increasing interest in hybridisation of Australian native orchids, the number of registrations is rising each year; well over 150 new hybrid names have been registered since the 3rd Edition was published in mid-1985. However, over 300 new names appear in this list. Many of these 'new' names result from the strict use of botanical nomenclature in the Checklist rather than the horticultural names preferred by the Royal Horticultural Society (R.H.S.) for some species. For example, the R.H.S. continues to use *Dendrobium phalaenopsis* for the registration of hybrids using the species *D. bigibbum* ssp. *laratensis* (In 1978, S.C. Clemesha reduced *D. phalaenopsis* to synonymy with *D. bigibbum*, giving it the name *D. bigibbum* ssp. *laratensis*; see The Orchadian, 6, 27 (1978)). As a result, the R.H.S. lists *D.* Orchidwood as the result of *D. bigibbum* x *D. phalaenopsis*, whereas adherence to botanical nomenclature recognises this cross as linebreeding within the species *D. bigibbum.*

At first glance, the use of strict botanical nomenclature in the Checklist would appear to increase confusion for the grower of Australian native orchids. Fortunately, the Editorial Committee has included clear explanations of the reasons for using botanical nomenclature and provides many examples of the results of this decision, devoting a special section to the confusion surrounding *D. bigibbum.* A list of synonyms between the R.H.S. horticultural names and the correct botanical names for Australian native orchid species is given on page 2 of the Checklist. Many registered hybrid names which are now synonymous are given in examples on page 3; for example, *D.* Peewee is now a synonym of *D.* Suzanne; *D.* Eleebana is a synonym of *D.* Painted Doll. All registered hybrid synonyms are listed in the hybrid lists.

This adherence to correct botanical nomenclature has important implications for people submitting plants to be judged by the ANOS Judges Panel. Since the ANOS Judges Panel now accepts all hybrids and species named in the 4th edition of the Checklist as legitimate names of Australian native orchid hybrids and species (see page 87 of this issue of The Orchadian), such well know registered hybrid names as *D.* Helen Banks, *D.* Helen Fukumura, *D.* Lady Constance, *D.* Anouk, *D.* Maui Queen, and others listed on pages 48 and 49 of the Checklist, are now recognised as Australian native orchid species or hybrids and will be judged as such by the ANOS Judges Panel.

The information in the Checklist is presented in four sections and two appendices. Section 1 lists the registered man-made hybrids and named natural hybrids. It is organised under genera and lists the registered name, the parentage, and the person who registered the cross (with the name of the originator in parenthesis if the originator and registrant are not the same person), and the year of registration. Where synonyms occur, the reader is referred to the correct name.

Section 2 is a cross reference list with an alphabetically arranged listing of parent species and hybrids. This section is possibly the most important and useful section of the Checklist. It will be very valuable not only at home but also at shows and meetings. I can see it being used time and time again to find the name of that new seedling which has flowered for the first time, and also to decide if a plant should be benched as an Australian native orchid hybrid.

Section 3 contains a listing of both named and unnamed natural hybrids, with validated references. A discussion on the naming of natural hybrids, with clear examples is given. This section contains important reference material for the more serious student of naturally occurring native hybrids.

Section 4 is an interesting section dealing with myths and legends which have developed over the years around such orchids as *Dendrobium kestevenii* and *Dendrobium* Profusion. Some would argue that this section is unnecessary as it does not refer to the parentage of Australian native orchid hybrids. However, it does not detract from the Checklist and presents important information relating to the incorrect use of *D. kestevenii* and *D.* Profusion as hybrid names.

A full list of synonyms cited in Section 1 is given in Appendix 1. Each entry is listed as it was originally published by the R.H.S., London. Appendix 2 contains a full list of the names and addresses of registrants and originators cited in Section 1.

On the inside back cover is a directory of the ANOS groups and affiliated societies.

I was disappointed to find a number of typographical errors in the text. Fortunately, however, these errors do not affect the correctness of the information in the lists and I have been assured that the Editorial Committee will correct these errors in the next edition or reprint of the list.

The Checklist is a useful, authoritative reference to the correct names of Australian native orchid species, man-made hybrids, and natural hybrids. The information is well presented with copious examples and completely referenced. As such it is more than a listing of hybrids and their parentage; it is also a desirable reference book which, for the price of $3.50 plus postage and handling, deserves to be on the bookshelf of all growers of Australian native orchids. The Checklist can be purchased from the Australasian Native Orchid Society, P.O. Box C106, Clarence Street, Sydney, N.S.W. 2000.

Noel J. Grundon.

THE AUSTRALASIAN NATIVE ORCHID SOCIETY JUDGES PANEL

At the meeting of the Australasian Native Orchid Society Judges Panel held on the 29th July, 1988, several matters were addressed which are of interest to associated Groups and others interested in the judging of Australian Native Orchids.

These matters were...

1. Staking of Exhibits

It was resolved that the staking of terrestrial orchids will be allowed, but growers are advised that such staking, if not judiciously applied, may be to the detriment of the exhibit in judging.

Staking of the inflorescence of epiphytes will not be allowed; however, there is no restriction on staking the pseudo-bulbs.

2. Checklist of Australian Native Orchids

It was resolved that the Australasian Native Orchid Society Judges Panel accepts all the hybrids and species named in the 4th edition of the Checklist of Australian Native Orchid Hybrids, published by the Council of the Australasian Native Orchid Society, as legitimate names for Australian Native Orchid Hybrids and Species.

For the Registrar, Mr. J. Walker,

Per ... Sid Batchelor, Assistant Registrar, A.N.O.S. Judging Panel.

Contributions to The Orchadian are always welcome. You do not need to be a botanist, taxonomist, or professional scientist. All that is needed is a desire to communicate your knowledge to the readers of The Orchadian.

Articles from both professional and non-professional people are welcome. The subject can be conservation, culture, observations made during trips, show results, descritpion of orchids in their native habitat, biographies of prominant orchid people, or any matter provided it deals with Australasian native orchids.

Send your contributions direct to: ANOS, P.O. Box C106, Clarence Street, SYDNEY, N.S.W. 2000.

AUSTRALIAN NATIVE ORCHID HYBRIDS

(New registrations by the R.H.S. from lists in the Orchid Review, April — June, 1988.)

NAME	PARENTAGE	REGISTERED BY
Dendrobium		
Gold Drops	Golden Fleck x *monophyllum*	W. Upton
Gracious Star	*tetragonum* x Gracious Falcon	W. Upton
Hot Shot	Hilda Poxon x Golden Fleck	W. Upton
Jilba	*kingianum* x Karloo	N. Roper
Lemon Lace	*gracillimum* x *tenuissimum*	W. Upton
Narraweena	Colin x Gillian Leaney	W. Upton
Nugget	Eureka x *gracilicaule*	W. Upton
Red Ballerina	Pink Ballerina x *bigibbum*	W. Upton
Southern Star	Eureka x Star of Gold	R. & D. Sheen
Sunspot	*gracillimum* x *monophyllum*	W. Upton
Wakehurst	John Upton x Kungara	W. Upton
Dendrogeria		
Mistique	*Den.* Ellen x *Flkga.* comata	W. Upton
Pterostylis		
Follower	Cutie x *furcata*	L. & K. Nesbitt
Triffid	*baptistii* x *plumosa*	L. & K. Nesbitt

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ANOS Council has decided to sell off much of its stock of back issues of The Orchadian due to limitation of storage space and also to raise funds. To achieve a quick turnover prices have been discounted by an average of 30%.

Stocks are running low and in some cases certain issues have been photocopied to make available complete volumes. Once these back volumes have been exhausted there will be no further reprints and these issues will be unobtainable.

Members wishing to obtain back volumes are advised to order now to avoid disappointment.

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- **ANOS Townsville Group**, Hon. Secretary, P.O. Box 326, Townsville QLD 4810. Tel: (077) 78 4311. Meets 8 pm on the 1st Tuesday of each month at Townsville Orchid Society Hall, Pioneer Park, Ross River Rd, Kirwan.
- **Native Orchid Society of Queensland**, (Associated Society) Hon. Secretary, P.O. Box 159, Broadway QLD 4000. Tel: (07) 264 3897. Meets 8 pm on the 1st Monday of each month at Bread House, 49 Gregory Tce., Brisbane.
- **Native Orchid Society of Toowoomba Inc.**, (Previously ANOS Darling Downs Group) Hon. Secretary, P.O. Box 5141, Toowoomba QLD 4350. Tel: (076) 35 8627. Meets 7.30 pm on the 1st Friday of each month at the Technical & Further Education Centre, Old Empire Theatre, Neil St., Toowoomba.

NEW SOUTH WALES

- **ANOS Far North Coast Group**, Hon. Secretary, 2 Main St., Alstonville NSW 2480. Tel: (066) 24 1023. Meets on the 1st Thursday of each month at Ballina High School, Burnett St. Ballina.
- **ANOS Newcastle Group**, Hon. Secretary, 9 Yvonne Close, Belmont North NSW 2280. Tel: (049) 48 6462. Meets on the 4th Wednesday of each month at the John Young Community Centre, Thomas St., Cardiff.
- **ANOS Central Coast Group**, Hon. Secretary, RMB 5430 The Ridgeway, Holgate NSW 2250. Tel: (043) 67 7694. Meets 8 pm on the 3rd Wednesday of each month in the Temple Kiely Visitors Centre, Dept. of Agric., Horticultural Research & Advisory Station, Research Road, Narara.
- **ANOS Warringah Group**, Hon. Secretary, P.O. Box 524, Dee Why NSW 2099. Tel: (02) 99 2468. Meets 8 pm on the 2nd Thursday of each month in the Thomas Vicar Mem. Hall, corner of Pitt & Grainger Rds, Nth Curl Curl.
- **ANOS Sydney Group**, Hon. Secretary, 51 Waratah Road, Turramurra NSW 2074. Tel: (02) 449 9593. Meets 8 pm on the 3rd Friday of each month at Lady Game Community Centre, Lady Game Drive, Lindfield.
- **ANOS Port Hacking Group**, Hon. Secretary, P.O. Box 359, Gymea NSW 2227. Tel: (02) 524 9996. Meets 8 pm on the 4th Tuesday of each month at the Community Hall, Gymea Bat Rd., Gymea.
- **Wollongong & District Native Orchid Society Inc.**, (Previously ANOS Wollongong Group) Hon. Secretary, 13 Eleanor Ave., Oak Flats NSW 2529. Tel: (042) 56 1608. Meets 7 pm on the 2nd Tuesday of each month at the Wollongong High School, Common Room, Lysaght St. Fairy Meadow.

VICTORIA

- **ANOS Victorian Group**, Hon. Secretary, P.O. Box 285, Cheltenham VIC 3192. Tel: (03) 583 4278. Meets 8 pm on the 1st Friday of each month at the West Hawthorn Uniting Church Hall, Power Rd., Hawthorn.
- **ANOS Geelong Group Inc.**, Hon. Secretary, Lot 2, Newcombe St., Drysdale VIC 3222. Tel: (052) 51 3186. Meets on the 2nd Wednesday of each month at the Fidelity Hall, Star St., Geelong.

SOUTH AUSTRALIA

- **Native Orchid Society of South Australia Inc.**, (Associated Society) Hon. Secretary, P.O. Box 565, Unley SA 5061. Tel: (08) 272 9245. Meets on the 4th Tuesday of each month at St. Matthews Hall, 67 Bridge St., Kensington.

WESTERN AUSTRALIA

- **Western Australian Native Orchid Study and Conservation Group (Inc.)**, (Associated Society) Hon. Secretary, P.O. Box 323, Victoria Park WA 6100. Tel: (09) 378 1278. Meets on the 3rd Wednesday of each month at the Kings Park Board Administration Centre Theatrette, Kings Park, West Perth.

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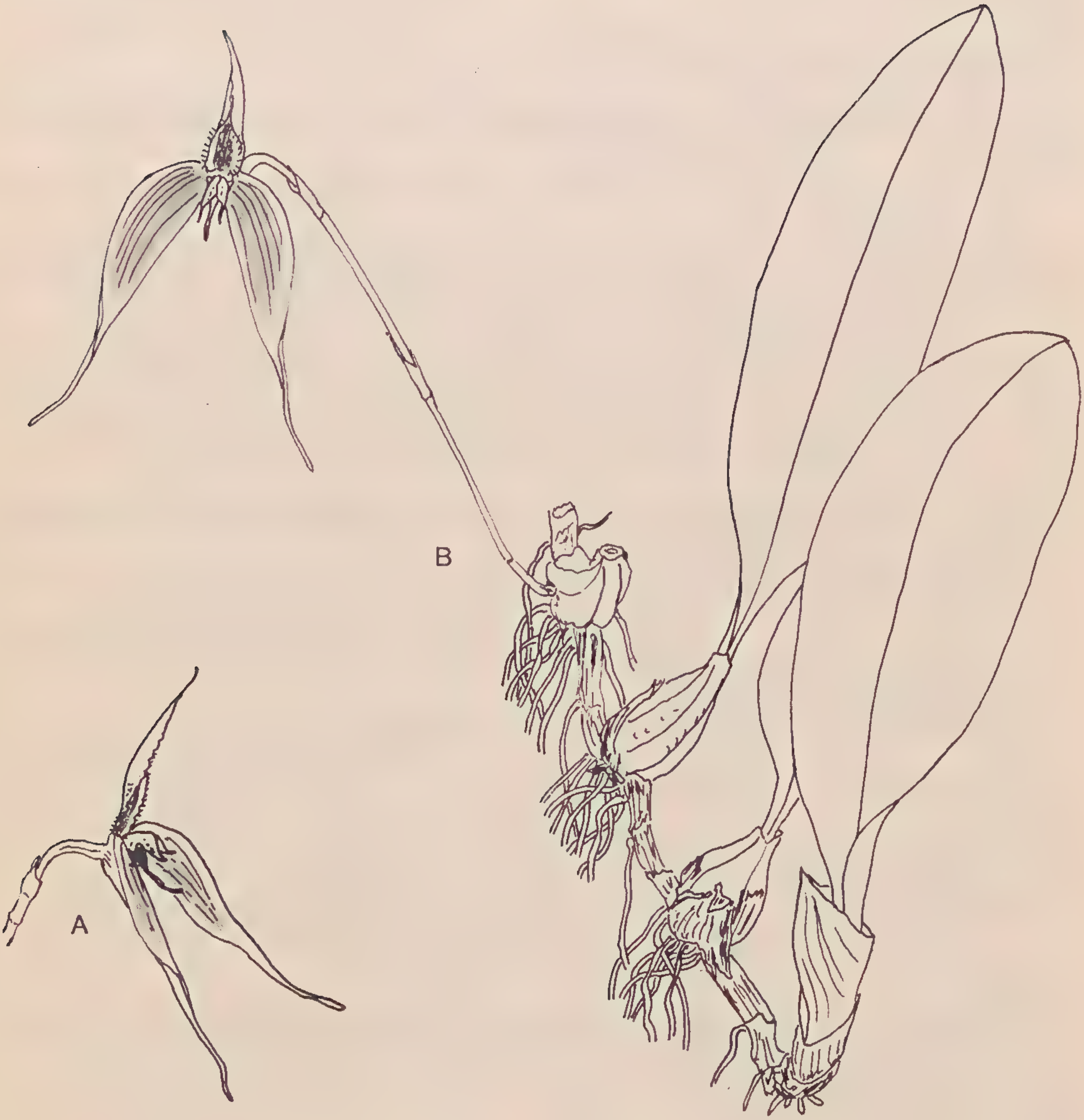
- **New Zealand Native Orchid Group**, (Associated Society) Convenor, 45 Cargill St., Dunedin, New Zealand.



Bulbophyllum masdevalliaceum Kraenzlin
from Rouna Falls, New Guinea

A	- Flower, side view	0.75 X
B	- Plant	0.75 X

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The Orchadian

Volume 9, No. 5
SEPTEMBER 1988

Dendrobium smilliae F. Muell.

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THE ORCHADIAN *VOLUME 9, No. 5*

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Dedicated to the study and conservation of Australasian native orchids which for this purpose shall include:

(a) orchid species occurring naturally in the Commonwealth of Australia and its Territories, New Zealand, New Caledonia, Vanuatu, Tuvalu, Fiji, West Irian, Papua New Guinea, Kiribati, all islands south-east of a line joining 0° Latitude 130° East Longitude and 20° South Latitude and 120° East Longitude, and all islands east of Australia to the International Date Line and south of the equator, and

(b) orchid hybrids whose parentage includes only species as defined above.

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Submit two copies of the manuscript, typed or printed single-sided on A4 size paper with double-spaced typescript. Margins should be at least 2.5 cm. For layout of the paper (e.g. title, abstract, text, etc.), use of italics, and the citation of references, consult a recent issue of The Orchadian.

Good quality colour slides (35 mm only) may be submitted but they must be relevant to the topic of the paper. All efforts will be made to return the slides to the author(s) after use.

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EDITORIAL

*In my first Editorial (*The Orchadian *Vol. 9, No. 2), you read the phrase, "*The Orchadian *is not my journal. It is your journal". Many times you will have read suggestions for articles — reports from* Around the Shows*; articles about* Club Activities*; and comments from readers on conservation issues and Peter Vaughan's "A Question of Parentage" (*The Orchadian *Vol. 9, No. 2, p. 36.). While there have been contributions to the* Readers' Forum *which indicates that somebody is out there and is reading* The Orchadian*, the general interest articles have been slow in coming. They are the missing portion of the mix I would like to maintain in each issue of* The Orchadian*: 40% – 50% 'scientific' articles; 20% – 30% 'semi-scientific' articles; and 20% – 30% articles of general interest.*

I have been most pleased with the response from our Editorial Associates and wish to publically thank them for the work they have done in encouraging 'scientific' and 'semi-scientific' articles from many people. In addition, the Editorial Associates have supplied the articles for From The Back of the Bushhouse *and have acted as referees for all articles printed in* The Orchadian. *'Scientific' articles have been supplied by people such as David Jones, Mark Clements, Neville Howcroft, and Leo Cady. 'Semi-scientific' articles have came from Ron Wheeldon, Norman Cruttwell, Max Gibbs, and John Hazelwood. In this issue, the names of Peter Adams, Sheryl Lawson, Trevor Prescott, and Brian Molloy are added to this list. In future issues, we will read articles by all the current Councillors of ANOS, as well as some 'new' authors and 'old' well-known names.*

All these authors are just like you; members of ANOS who volunteer their time and talents to pass on their knowledge, expertise, and enthusiasm for the hobby we all share. The Orchadian*would not exist without the dedication of these volunteer authors. To help offset some of this effort on the part of the author, ANOS Council has recently agreed to provide the authors with six free copies of the issue in which a 'scientific' article appears, and one free copy of the issue in which a general or cultivation article (minimum length of about one page) appears. Authors requiring copies in addition to their free entitlement must notify ANOS Council when they submit their article and must pay the extra printing cost.*

So will you be in it? If you are not scientifically inclined, give thought to writing an article on your successful cultural methods for some 'difficult-to-grow' species — just like Ian Carter has done for Cymbidium suave *in the* Reader's Forum *in this issue.*

Over the past spring months there have been many events which should cause people to put pen-to-paper — Spring Shows have came and gone; seedlings of new crosses have flowered for the first time; and you have finally succeeded in growing and flowering what for you has previously been "that impossible-to-grow species". The coming summer months are when our epiphytes grow most quickly, and when the terrestrials become dormant. Cultural techniques must change to get the best flowering next spring — and that change must occur now! How about an article on the subject? Share your knowledge and enthusiasm with us, your friends in the Australasian native orchid world!

The Orchadian ***is your journal. Your article will help make it even more so!***

Noel J. Grundon

FROM THE BACK OF THE BUSHHOUSE

Murray J.G. Corrigan
19 Allington Crescent, Elanora Heights, N.S.W. 2101.

In this issue, I have departed from previous tradition with the authorship of *From the Back of the Bushhouse* which, until now, has been written by our Associate Editors. Murray Corrigan, Immediate Past President of ANOS, is our contributor this month. I am hoping that this will become a tradition for future September issues of *The Orchadian*: that of inviting the retiring President of ANOS to say a few last words on his hopes for the organisation he has just handed over to a new President and Council — The Editor.

This year our Society celebrates its 25th Anniversary. A brief flicker of an eyelid in geological time scales when you consider that our fossil flora, or its ancestors, were here while Australia was part of the Great Southern Continent some 60 million years ago[1].

As one of the foundation members of the Provisional Committee gathered together in 1963 by Walter Upton and Bill Murdoch, I recall that we discussed with great enthusiasm, and at times some heat, how we native orchid enthusiasts were going to change exotic orchid growers perceptions of Australian native orchids, their culture, conservation, scientific study, equitable judging, and increased general perception and appreciation.

Referral to the first few issues of *The Orchadian* will quickly show you how enthusiastic we were. Do I hear you say: "I have not got Vol. 1". Then you jolly well should have! Those early Volumes are chock full of interesting and absorbing information.

Our lofty 'Aims and Objectives' as enunciated in *The Orchadian* Vol. 1 No. 1 – have they been achieved in the intervening quarter century?

A brief review of those aims and objectives as enunciated and adopted at our inaugural meeting in the Y.W.C.A. hall on the 6th July 1963, would be, I feel, timely.

Today's reader will, in many cases be surprised to know that just 25 years ago we did not have current, up-to-date scientific literature available for reference. Rupp's "The Orchids of N.S.W." of 1943 was long out of print, exorbitantly expensive second hand, and scientifically out of date. The Australian Orchid Review under succeeding great orchidologist Editors was one source of information. The Victorian Naturalist and the Proceedings of the Linnean Society were available to the few, providing a wonderful range of information, albeit often dated.

Because of this paucity of accurate information, which had continued from the pre-war period, Australian enthusiasts had to become letter writers, and so developed the period of the great communicators. This network spread throughout Australia and included the following – Rupp, Nicholls, Rogers, Messmer, Harris, Hatch, Gordon, the Giles', Clemesha, Beauglehole, Dockrill, Hunt, St. Cloud, Brinsley, Cady, Ford, Fordham, Upton, Corrigan, Coleman, Freda Coate, Hilda Curtis, Ingram and the Althofers'.

Reading Vol. 1, you will note that many of these same correspondents were your first authors. The war and its attendant post war austerity period had no room for native orchid publications, that is with the exception of the great work by Rupp. I bought my copy as a school boy on day leave from boarding school for 2/6, and commenced an interest that has so far spanned 45 years.

In the intervening 25 years we have seen a burgeoning plethora of native orchid books ranging from superb, to excellent, to poor, to some that should never have been published.

Whilst I do not intend to imply that ANOS was solely responsible for this increased awareness, I do know that the Society with its increasing membership, Group formation, and publishing influence, was the prime mover. The gathering together of enthusiasts nationally, in a cohesive society, resulted in a marshalling of knowledge and cemented the aims and objectives that have guided us for so long. Groups were formed in Sydney, then Warringah, Newcastle, Victoria, and Toowoomba, and the numbers increased as we gathered momentum. Look at the list of Groups and Affiliates in the back of your Orchadian!

Our long held belief that *Cymbidium* and exotic orientated judges were incapable of fairly assessing the worth of native orchids at shows was strong. At almost every show it was confirmed. Attendance and completion by me of an O.S.N.S.W. Judging Course confirmed our worst fears. Something had to be done! How long that something would take was not anticipated. So began our historic battle of over 20 years to achieve Australian native orchid and Australian native orchid hybrid standards, their publication, and more importantly their use!

We now have our standards adopted by the O.S.N.S.W. and the Australian Orchid Council. Through the efforts of far sighted ANOS judges and our Registrars, we now have ANOS trained judges judging our meetings and shows. More importantly, our judges are now being demanded by O.S.N.S.W. affiliated society's to judge their native classes. A quantum leap from 1963. We have ANOS Award Standards, created by us, and awarded by our judges.

When authors were unable to find a publisher, it was ANOS, who through its then Editor, arranged a financial grant from the late Stanley Smith, an Australian tin mining magnate, then living in Bermuda. So Dockrill's "Australasian Sarcanthinae" was published. Capital and interest from that grant, in trust, is used by ANOS today.

Our aim – "to publish, edit and review literature"[2] – saw the birth of *The Orchadian*.

We Councillors spent many long hours deciding on the name. Our Orchadian has grown from a simple foolscap sheet format to the ultimate excellence of Vol. 9 you are now receiving. It was, and is, hard work.

Those early volumes were hand typed by your Editor for direct reproduction, printed, and in the case of the first volume, collated, stapled, folded, enveloped, and mailed by your Councillors. This meant that in those formative years your Council met almost weekly.

Today your Editor works just as hard. With his word processor he personally types all copy ready for automatic typesetting. Members owe a great debt to their Editors for the countless long hours devoting themselves to your reading enjoyment at the expense of family and their own orchid interests. Each Editor has had to not only contend with finding material to maintain the standard but to contend with Council's cash situation. It's a simple fact that costs fast exceed income when you are publishing to *The Orchadian* standard.

It is a world recognised and accepted publication. We have members all over the world – Russia, Germany, Sweden, U.S.A., Great Britain, France, New Zealand, Switzerland, etc.

Interest in our hobby is burgeoning; you only have to attend a monthly meeting of a Group, or a Spring Show to appreciate this. The crowds flock to gaze at and buy flowering plants. Every-one asks for a piece of the Champion "over there on the bench!"

Our hybridists are numerous; only the very perceptive with superb parent stock plants will survive commercially. However, enthusiasts will benefit from competitive prices, often below cost, and a wider diversity of hybrids are being produced. It is a healthy situation.

You will have read the Editor's review in the last Orchadian of our latest Australian native orchid hybrid list. We devoted many long hours to its creation. The few typographical errors due to very late resetting of the type, have already been eliminated. It is the finest list available, with definitive statements eliminating the long held confusion held by overseas parties on the correct determination of our native orchids and their hybrids. Have you obtained your copy?

From my observation point 'back of the bushhouse' it is obvious that ANOS, despite some shortcomings, is in good health. Our newly elected Council is, to my appreciation, (having served in various capacities for roughly eighteen of those years), about the best we have ever had. Our President who founded the Society, a good meld of grey heads, the mature without hair to grey, and the young lions. Past Councillors can rest easy in the knowledge that the Society is in excellent hands. The next few years with Council activity, nomenclatural changes of vast scale, and new publications, will be immensely exciting.

Why not get out and buy the early volumes of *The Orchadian*? Refresh your memory and learn new things. Introduce friends to the Society and its work. Only numeric strength in members and finance will allow us to continue the job.

From the back of the bushhouse it's time to leave you. I have new shade cloth to spread and protect my dainty beauties that will knock the spots off Sluggo Hazelwood and Wally's best.

Further Reading

1. *The Greening of Gondwana* by Mary E. White.
2. *The Orchadian* Vol. 1. No. 1.

REINSTATEMENT OF THE GENUS *CYRTOSTYLIS* R. BR. AND ITS RELATIONSHIPS WITH *ACIANTHUS* R. BR. (*ORCHIDACEAE*)

D.L. Jones and M.A. Clements

Australian National Botanic Gardens, P.O. Box 1777, Canberra, ACT, Australia, 2601

This article appeared first in *Lindleyana* 2(3): 156-160. 1987. Reprinted with permission of the American Orchid Society, Inc. and the authors — The Editor.

Abstract: The generic delimitations of *Cyrtostylis, Acianthus,* and *Townsonia* are discussed. *Townsonia* is considered congeneric with *Acianthus,* whereas *Cyrtostylis* R.Br. is regarded as distinct from *Acianthus* R. Br. and is reinstated at generic rank. Detailed comparisons are made between the two genera. The combination is made for *Cyrtostylis tenuissima* (Nicholls and Goadby) D. Jones and M. Clements, and *Cyrtostylis robusta* D. Jones and M. Clements is described as new.

The Orchid genera *Acianthus* and *Cyrtostylis* were both described in 1810 by Robert Brown from material collected in Sydney, Australia (Clements, 1983). The genera were distinguished on features of their labella and columns, with particular emphasis on the presence or absence of column wings (Brown, 1810). At the time of publication, three species of *Acianthus* were recognized: *A. caudatus* R. Br., *A. exsertus* R. Br. and *A. fornicatus* R. Br., while *Cyrtostylis reniformis* R. Br. was the sole representative of that genus.

Within a few decades, new taxa were being added to these genera. In *Cyrtostylis,* new species were described from material collected in Western Australia (Endlicher, 1846) and New Zealand (Hooker, 1853). In the latter publication, J.D. Hooker also described a new species of *Acianthus* from New Zealand, *A. sinclairii* J. D. Hook. Shortly thereafter, he described a further species, *A. viridis* J. D. Hook., from material collected in Tasmania. He included it in the genus *Acianthus* despite the presence of broad column wings, a character previously used to separate *Cyrtostylis* from *Acianthus* (Hooker, 1859). Hooker's interpretation of these taxa was followed by Bentham (1873), Pescott (1928), and Ewart (1931).

In 1906 a new genus, *Townsonia,* was described from material collected in New Zealand (Cheeseman, 1906), but it was subsequently shown that this taxon and *A. viridis* were synonymous (Schlechter, 1911). In the same paper, Schlechter maintained that *Acianthus* and *Townsonia* were distinct while earlier he had proposed the amalgamation of *Acianthus* and *Cyrtostylis* because of the general similarity of the taxa involved (Schlechter, 1906). Schlechter's interpretation of the taxa generally has been accepted until now (Rupp, 1943; Black, 1943; Willis, 1962; Firth, 1965; Nicholls, 1969; Clements, 1982; Johns and Molloy, 1983; Hoffman and Brown, 1984), although some authors have preferred to include *Townsonia* as well within *Acianthus* (Moore and Edgar, 1970; Curtis, 1979).

In this paper the limits of the genera will be examined based on a new study of the Australian taxa.

Generic Limits

While preparing the account of *Acianthus* sens. lat. for the forthcoming orchid volume of *Flora of Australia,* we became aware of consistent significant features which indicated the presence of two distinct monophyletic assemblages. Subsequent detailed morphological examination of fresh material of many species has confirmed this view. Therefore, *Cyrtostylis* R. Br. is considered distinct from *Acianthus* R. Br., and it is reinstated here. They are distinguished by the features in Table 1. Vegetatively, both genera are similar; however, the ground-hugging leaves of *Cyrtostylis* species are distinctive (Fig. 1), while those of *Acianthus* are carried well above ground level on a prominent petiole (Fig. 2). The leaf undersurface in *Cyrtostylis* is consistently light green and glistening with an abundance of swollen pellucid cells of a siliceous nature. Cells of this type are absent in *Acianthus,* and the leaf undersurface frequently is colored by anthocyanin pigments. Leaf venation in each genus is different (Fig. 3, 4), and each relies for its survival on a different group of mycorrhizal fungi (Warcup, 1981).

The caudate tips on the floral segments of species of *Acianthus* are a useful diagnostic feature (Fig. 5), being absent from species of *Cyrtostylis* (Fig. 6). These tips appear glandular and may play a role in the attraction of pollinators. The simple pollinia of *Cyrtostylis* (Fig. 7) are very like those of *Caladenia* R. Br. in shape and texture and are very different from the more complex pollinarium of -

Table 1. Comparison of *Acianthus* R. Br. and *Cyrtostylis* R. Br.

Feature	*Acianthus*	*Cyrtostylis*
Leaf shape and colour	Leaf cordate to palmate, dark green above, reddish purple or green beneath.	Leaf reniform to ovate, light to medium green or gray-green above, greenish white and pellucid beneath.
Leaf orientation	Held well above soil surface on a petiole.	Ground-hugging and sessile.
Leaf venation	Midrib plus intramarginal vein, 1 pair of secondary veins not parallel to margin.	Midrib plus intramarginal vein, 3 pairs of secondary veins more or less parallel to margin.
Sepals and petals	Sepals much longer than petals; tips terete, caudate, glandular.	Sepals and petals of similar length; tips acute or obtuse, non-glandular.
Labellum shape, surface, and glands	Labellum more or less cordate, concave or convex, basal glands tonsil-like, prostrate, or vestigial, surface smooth or papillate.	Labellum more or less oblong, flat, basal glands erect, conical, with a flat central plate on lamina, surface smooth.
Column features	Column curved, conspicuously gibbous behind anther, wings absent or vestigial (Fig. 9).	Column curved, not gibbous behind anther, wings prominent (Fig. 10).
Pollinarium	Pollinia 4, attached directly to a viscidium.	Pollinia 4, plus viscid material, viscidium absent.
Pollinia shape and texture	Clavate, hard, waxy.	Boomerang-shaped, falcate, mealy.
Symbiotic fungi (Warcup, 1981)	*Tulasnella calospora, T. cruciata.*	*Sebacina vermifera.*

Acianthus (Fig. 8). *Townsonia* is under further investigation, but at this stage is considered congeneric with *Acianthus*.

Nomenclature

1. *Acianthus* R. Br., Prodr. 321. 1810.

Type: *A. fornicatus* R. Br., "Port Jackson," May 1802, *R. Brown s.n.* (Holotype: BM!; Isotype: K!).

Notes: A genus of approximately 18 taxa distributed in Australia, New Zealand, the Solomon Islands, New Guinea, and New Caledonia.

2. *Cyrtostylis* R. Br., Prodr. 322. 1810.

Type: *C. reniformis* R. Br., "Port Jackson", May-June 1802, *R. Brown s.n.* (Holotype: BM!).

Notes: A genus of five or more species from Australia and New Zealand. One species is transferred here to the genus, and a new species is described. Other taxa are under investigation.

***Cyrtostylis tenuissima* (Nicholls & Goadby) D. Jones & M. Clements, comb. nov.**

Basionym: *Acianthus tenuissimus* Nicholls & Goadby in *Victorian Naturalist* **50**: 22, + t. 1933.

Type: Bayswater, near Perth, Sept.-Oct. 1932, *B. T. Goadby* (Holotype: PERTH!; Isotype: PERTH!).

***Cyrtostylis robusta* D. Jones & M Clements, sp. nov.**

Affinis *C. reniformis* R. Br. sed multo robustiore, ad altitudinem circa 25 cm crescens, floribus usque ad 7, foliis virentibus et labello majore (ad 15 mm x 6 mm) differt.

Slender herb to 25 cm tall. Leaf 3-6 cm x 2.5-4 cm, broadly ovate to reniform, light to medium green above, pellucid beneath, secondary veins forming ridges on the underside, margins entire. Peduncle 10-17 cm x ca. 1 mm, slender, stiffly erect. Floral bracts 3-4 mm x ca. 2.5 mm, ovate, acute. Pedicel 1-2 mm long. Flowers 2-7, 12-14 mm long, pinkish red, segments slender, except the labellum. Dorsal sepal 11-15 mm x 2-2.5 mm, linear-lanceolate, erect or incurved, obtuse. Lateral sepals 10-12 mm x ca. 1 mm, linear-lanceolate, somewhat falcate, usually more or less parallel beneath the labellum, acuminate. Petals 10-12.5 mm x ca. 1 mm, linear, acuminate, spreading or recurved. Labellum 11-15 mm x 4.5-6 mm, oblong, projecting forward

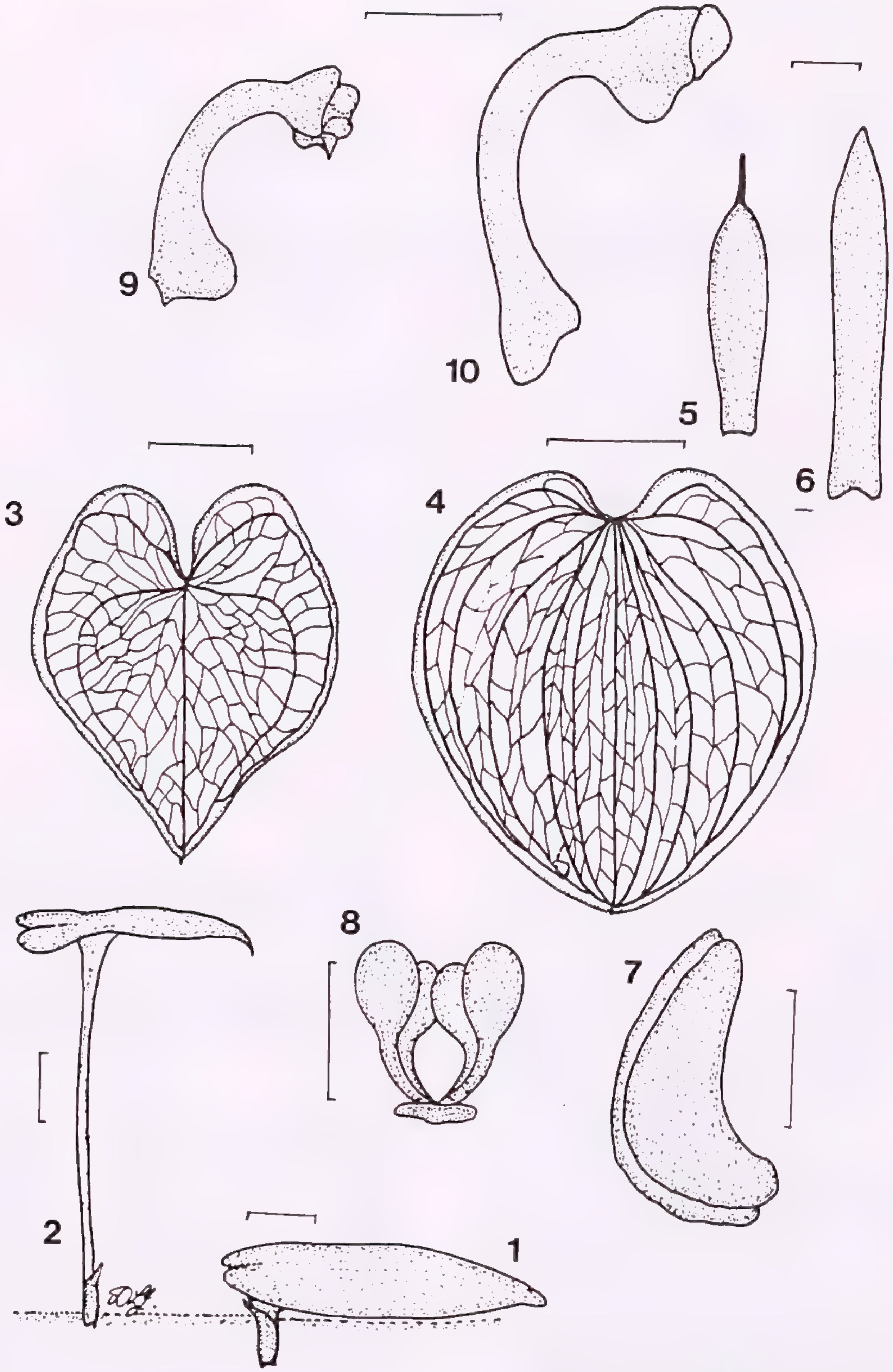

Fig. 1-10. Habit and morphology of *Acianthus exsertus* (Toowoomba, Queensland) and *Cyrtostylis reniformis* (Neath, New South Wales) **1.** Leaf relative to ground level, *C. reniformis*. Scale bar = 10 mm. **2.** Leaf relative to ground level, *A. exsertus*. Scale bar = 10 mm. **3.** Leaf venation, *A. exsertus*. Scale bar = 10 mm. **4.** Leaf venation, *C. reniformis*. Scale bar = 10 mm. **5.** Dorsal sepal, *A. exsertus*. Scale bar = 2.5 mm. **6.** Dorsal sepal, *C. reniformis*. Scale bar = 2.5 mm. **7.** Two pollinia, *C. reniformis*. Scale bar = 0.5 mm. **8.** Pollinarium, *A. exsertus*. Scale bar = 0.5 mm. **9.** Column, *A. exsertus*. Scale bar = 2 mm. **10.** Column, *C. reniformis*. Scale bar = 2 mm.

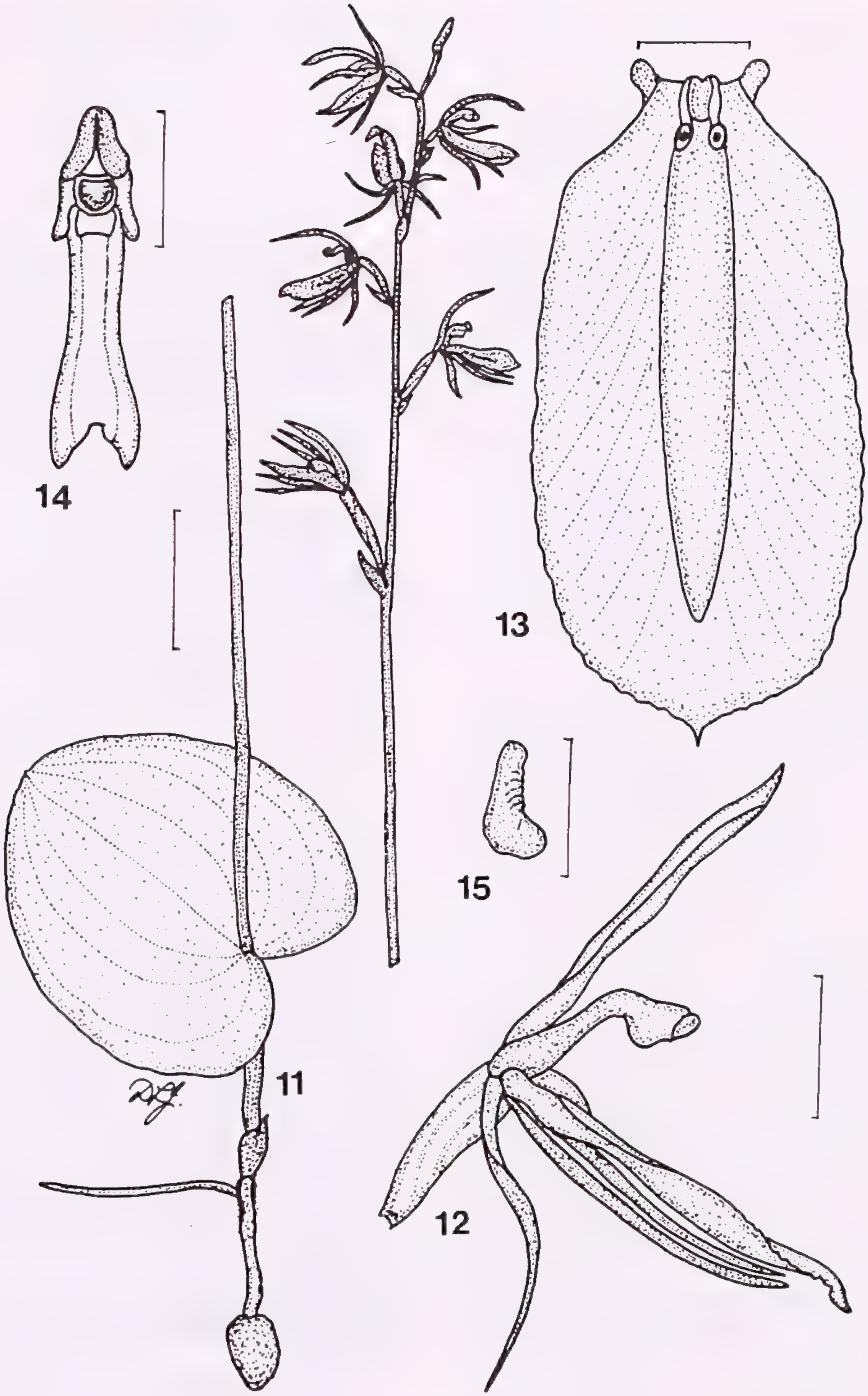

Fig. 11-15. Habit and features of *Cyrtostylis robusta* (Clements 4108). **11.** Whole plant. Scale bar = 20 mm. **12.** Flower. Scale bar = 4 mm. **13.** Labellum from above. Scale bar = 2 mm. **14.** Column, front view. Scale bar = 2 mm. **15.** Pollinium. Scale bar = 1 mm.

or more or less decurved, flat or sometimes shallowly curved upward, usually darker than the other segments, distal margins crenulate, apex acute to mucronate; basal glands 0.5-0.7 mm long, conical, erect or curved, red with a dark central apex, connected to a linear central plate approximately 0.8 x 1.2 mm. Column 4.5-5 mm long, abruptly curved at 70-90 degrees near the middle, swollen and more or less auriculate at the base, winged in the distal third, the wings 1.2-1.5 mm wide. Anther cap approximately 1 mm x 1 mm, ovate, obtuse. Stigma approximately 5 mm x 5 mm, more or less rectangular, sunken. Pollinia approximately 1 mm x 0.5 mm, boomerang-shaped, falcate, yellow, mealy. Capsule approximately 12 mm x 5 mm, obovoid. Fig. 11-15.

Type: WESTERN AUSTRALIA: ca. 5 kilometers south of Jerramungup, 28 Aug. 1986, *D. L. Jones 2410* (Holotype: CBG; Isotypes: CBG, AD, K).

Distribution: Southwestern Western Australia, southern South Australia, southwestern Victoria.

Habitat: Costal scrub, particularly on stabilized sand dunes, also sclerophyll forest under species of *Eucalyptus* and *Casuarina*.

Flowering Period: June-August.

Affinities: *Cyrtostylis robusta* is closely related to *C. reniformis* but is much more robust, taller-growing, and with more flowers per raceme. It also has a green leaf, whereas the leaf of *C. reniformis* is grayish to bluish green, and the flowers of *C. robusta* has a larger labellum. It is found in south-central and southwestern regions of the continent and does not overlap in distribution with *C. reniformis*.

Acknowledgements

The authors thank Jim Armstrong, Australian National Botanic Gardens; Alex George, Executive Editor, *Flora of Australia*; and Stephen Hopper, Department of Conservation and Land Management, all of whom provided discussions and constructive criticism of the manuscript. They also thank Michael Crisp, Australian National Botanic Gardens, who provided the Latin diagnosis, and Barbara Jones, who processed the manuscript, and they are grateful to Collin and Dorothy Woolcock, Ron Heberle, Ron Tunstall, John Roberts, Helen Richards, and Ruth Clark for collecting fresh specimens on their behalf. The work of D.L. Jones was funded by a grant from the Australian Biological Resources Study.

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MULTIPLE BEE POLLINATORS OF *DENDROBIUM KINGIANUM* BIDW. IN THE NATURAL HABITAT

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Summary: In its natural range of distribution, *D. kingianum* Bidw. is pollinated by at least two different species of bee. The introduced honey bee, *Apis mellifera* Linn., and a smaller native *Trigona* Jurine species were confirmed as effective pollinators accounting for observed seed capsules. A set of criteria for verifying pollinator status is outlined; these criteria are recommended in interpreting the observations of insect pollination of orchids.

Introduction

The pollination of *D. kingianum* Bidw. by the common honey bee *Apis mellifera* Linn. was recently reported in a private orchid collection (Adams and Lawson 1987). After several unsuccessful attempts to observe pollination in the natural distribution range, a predicted natural pollination by eusocial bees can now be confirmed. During October 1987, several colonies of pink and white flowering *D. kingianum* between Port Macquarie and Newcastle, N.S.W. were examined and the following observations were made.

Observations of Pollination

Pink flowering *D. kingianum* was pollinated by large bees, subsequently captured and identified as the common honey bee *Apis mellifera* (Fig. 1). The essential events for pollinator status were clearly visible during the visit of a bee which arrived at the site without pollinia on any part of its body. It landed on the labellum of a flower with an intact anther and probed deeply along the mid lobe callus, moving the hinged labellum up and down rapidly. It reversed several seconds later, knocking back the anther cap and causing the pollinia to eject onto the dorsal thorax, where they became firmly attached to hairs. The bee moved to the labellum of an unpollinated flower on a nearby plant and again pushed inwards towards the base of the column. The thorax formed a close fit with the column, pressing the pollinia into the recessed cavity of the stigma. Finally the bee emerged from the flower minus the pollinia, which were clearly visible on the sticky stigmatic surface.

Thus, a full pollination sequence was observed, as described in the earlier report, and outlined in the discussion under pollination criteria 1-5. Weather conditions at the time of pollinator visits were warm (24 °C) and sunny, with a gentle intermittent breeze. *Dendrobium kingianum* fragrance was pronounced.

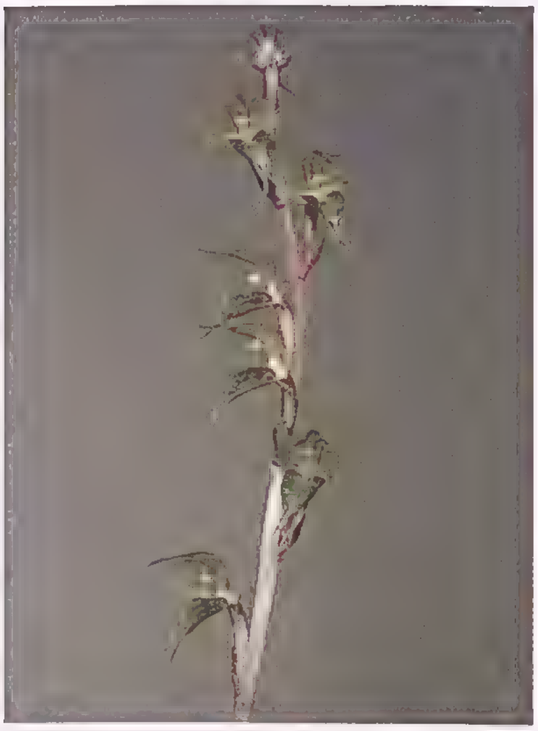
Apis mellifera visited many plants in a colony of *D. kingianum* and also a wide variety of understorey shrubs including *Leptospermum* Forst. and Forst. f, *Hibbertia* Andr., *Tetratheca* Sm., *Pomaderris* Labill., and various legumes.

Small dark coloured bees were observed to visit and take up pollinia from a group of *D. kingianum* where *A. mellifera* were also active. The source of the bees was traced to a nearby small hive in a tree stump; they were captured and later identified as native *Trigona* Jurine (Fig. 2). When *Trigona* enter the flowers they travel down the concavity of the labellum causing minimal labellar movement. Ken Russell of Dungog N.S.W. (pers. comm.) has repeatedly observed a full pollination sequence (criteria 1-8) of *D. kingianum* by *Trigona*, with resultant development of seed capsules on small and large flowering plants.

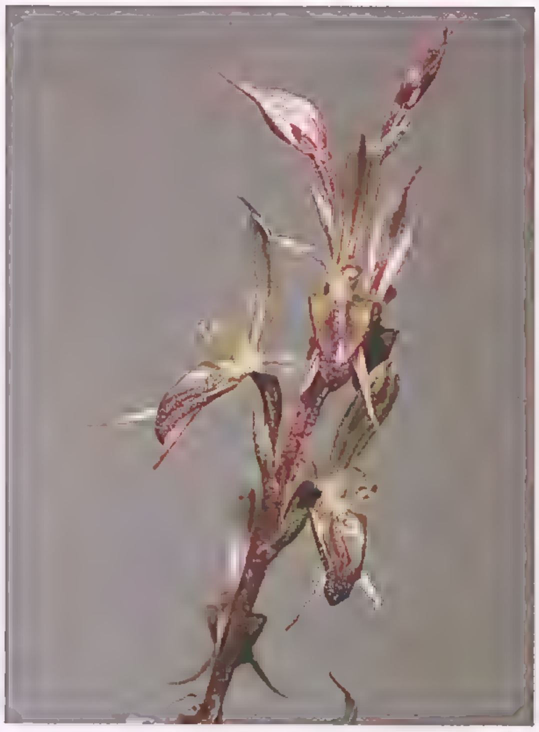
The movements of both *Apis mellifera* and *Trigona* are primarily between flowers on the one plant, and between adjacent plants that are closely spaced. The bees rarely exchange pollen between flowers that are more than 1.5 metres apart, and preferentially exchange pollinia between flowers separated by less than 0.5 metres when they are available.

In the *D. kingianum* colonies when almost all flowers were open in early October, more than 60% of flowers had anther caps displaced and pollinia removed. However, the percentage of flowers with pollinia deposited on the stigmatic surface was less than 10%, suggesting that many visits to flowers do not result in effective pollination. Approximately one per cent of flowers were developing seed capsules at this time, and this value is likely to rise to the range of 2 - 10% reported previously (Adams and Lawson 1987).

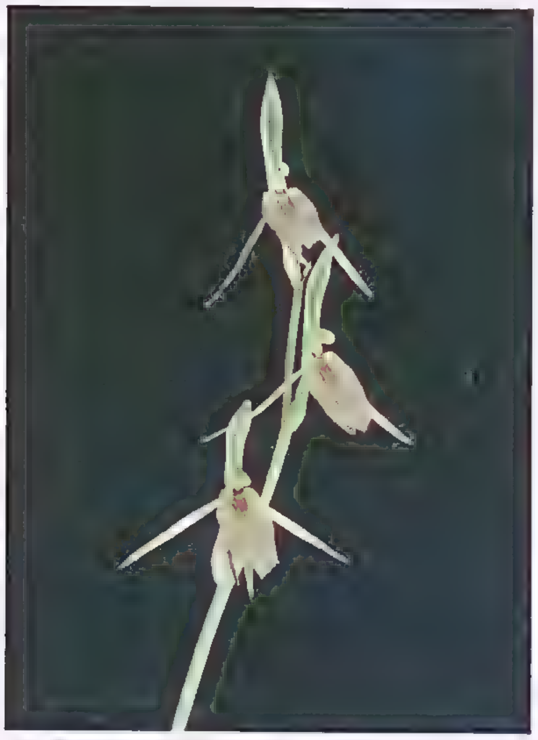
The following colour plates are included as an aid in the identification of these species described in the article by David Jones and Mark Clements. — For Editor.



Acianthus fornicatus R. Br.
Seven Mile Beach, NSW.
Photo by Ron Tunstall.



Acianthus exertus R. Br.
Falls Creek, Vic.
Photo by Ron Tunstall.



Cyrtostylis reniformis R. Br.
Neath, NSW.
Photo by Mark Webb.

The following colour plates are to illustrate the articles 'Multiple bee pollinators of Dendrobium kingianum*' by P.B. Adams and S.D. Lawson. 'A puzzling precious orchid' by T. Prescott and one of the most recently registered Australian Native Orchid Hybrids,* Plectochilus *Kilgra. — For Editor.*

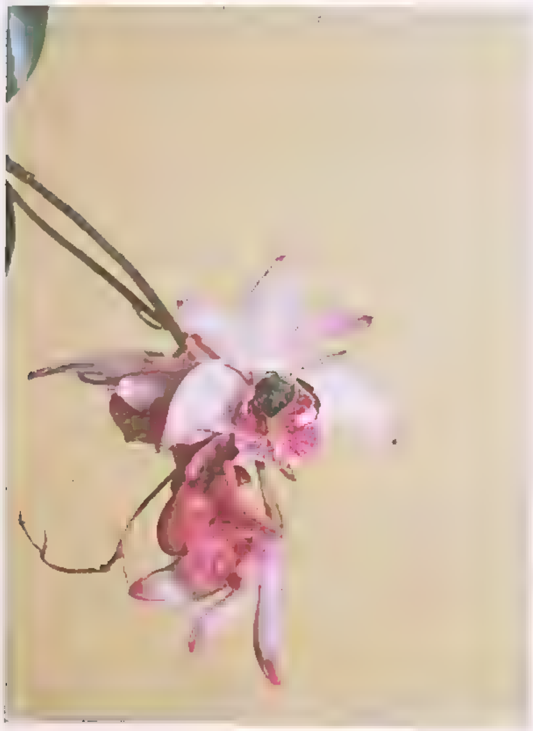
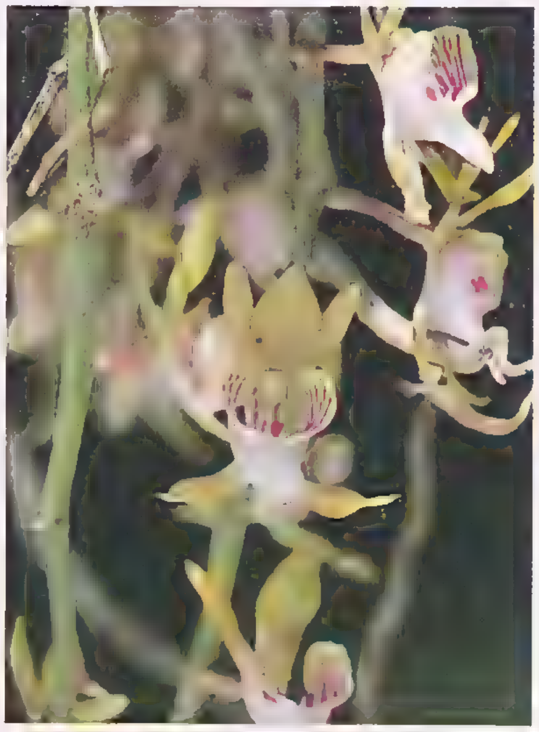


Fig. 1 - *Apis mellifera* pollinating of *Dendrobium kingianum.*
Photo by Adams & Lawson.



Sarcochilus australis (Ldl.) Reichb. f.
NW. Dorrigo, NSW. (See page 109).
Photo by Mark Webb.

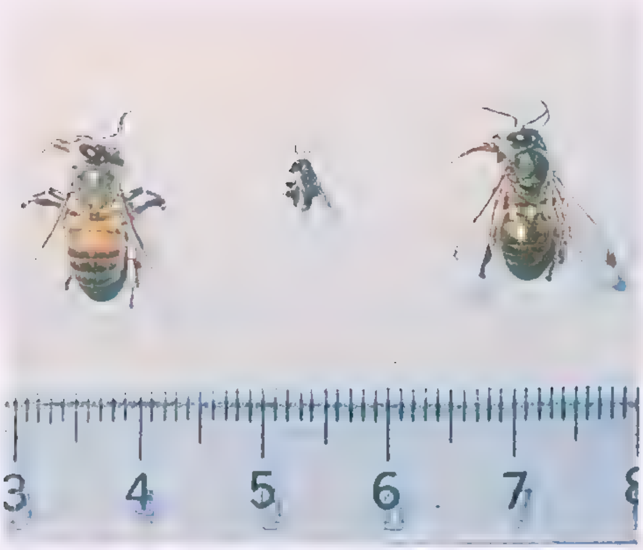
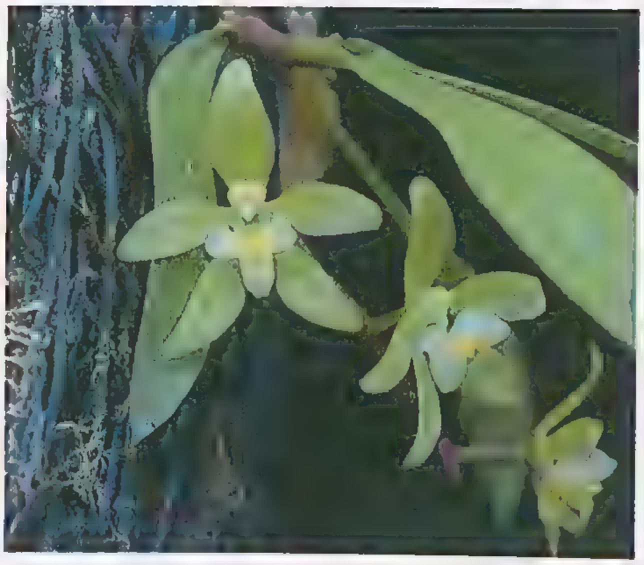


Fig. 2 - Confirmed pollinators of *Dendrobium kingianum.*
Photo by Adams & Lawson.



Plectochilus Kilgra (See page 112).
Grower S. Batchelor.
Photo by Mark Webb.

Discussion

Criteria for Pollinator Status

Orchids are visited by many different animals, only some of which pollinate flowers. Criteria for pollination have rarely been considered in reporting interactions between orchids and their potential pollinators. We consider that there have been many misleading and invalid reports of pollination based on incomplete observations. To verify if an insect or bird is a pollinator of a particular orchid, the following criteria are proposed:

1. Observation of the pollinator alighting on a flower which has an intact pollen cap and pollinia.
2. Pollinia uptake is more easily verified if the visiting pollinator does **not** already carry orchid pollinia on arrival of the flower.
3. Pollinator enters the flower and contacts the anther.
4. Pollinia noted to be attached to the pollinator when it leaves the flower.
5. Re-entry of the pollinator into the same or another flower with pollinia transferred from pollinator to a stigmatic surface which did not previously contain pollinia.
6. Capture and correct identification of pollinator.
7. Resultant development of a seed capsule containing viable seed.
8. Correct identification of orchid species.

The study is more complete if all events of pollinia transfer from anther to pollinator, and from pollinator to stigmatic surface can be observed. In practice under field conditions this is extremely difficult to achieve. Minimum criteria to claim pollinator status should include uptake of pollinia from the anther, unequivocal deposition on a stigma, and correct identifications. Observations of insects and birds on floral parts, or entering flowers with or without pollinia are **not** sufficient to claim that pollination has occurred. When observations are insufficient to meet minimum criteria the terms "probable" or "suggested" pollinator should be used.

Bee Pollination of *D. kingianum*

The eusocial bees *A. mellifera* and *Trigona* are found commonly throughout the natural distribution range of *D. kingianum*. *Apis mellifera* is widespread as a hive bee of commercial apiarists and in feral populations in the natural forest. Worker bees have a range of 2-5 km. and a short life span of approximately six weeks. *Trigona* bees live for about 12 weeks, and form nests in hollow logs, with honey collections in large pots. Their foraging range has not been determined with certainty, but is considerably shorter than that of *A. mellifera*. They are the only native bee without a sting, but can deliver a fairly innocuous bite. It is not possible to identify *Trigona* to the species level from a small number of specimens, as the genus requires substantial taxonomic revision. The common Australian species which have commonly been quoted are *T. cockerelli* Rayment 1930 and *T. carbonara* Smith 1854. *Apis* and *Trigona* collect nectar and pollen predominantly from non-orchidaceous plants, and probably visit dendrobiums coincidentally, attracted by colour and fragrance. Little or no nectar is available to them from *D. kingianum*.

Multiple Pollinators of Australian Orchids

It has proved extremely difficult to find pollinators meeting the criteria recommended for pollinator status. This problem has contributed to the scarcity of reports of multiple pollinators for Australian orchids. There has been too little study to make any conclusions about the frequency and importance of multiple pollinators. The search for pollinators should not stop after a single pollinating species has been confirmed.

A. mellifera is most likely to be a moderately effective pollinator of larger flowering clones. The frequent observation of displaced pollinia and pollen caps, and ineffective pollination of small to moderate-size flowers is likely to be related to the difficult entry of *A. mellifera* into these flowers. These visits, and the activity of other insects which displace pollinia from the anther, have the effect of lowering the frequency of seed capsules. The observations of a close spatial relationship of *Trigona* to floral parts, and of high efficiency of transfer of pollinia suggest that it is potentially an important pollinator of the range of floral sizes of *D. kingianum*.

A number of pollinators may yet be found if other *Dendrobium* species with small and larger flowered variants are examined. Stoutamire (1983) found multiple wasp pollinators for several Western Australian *Caladenia* R. Br. species, and in some wasp and fly pollinated *Prasophyllum* R. Br., multiple pollinators have also been reported (Garnet 1940; Bates 1984). The roles of multiple pollinators in the ecology and survival of orchids is yet to be explored. *Apis mellifera* must be regarded as a relative newcomer, dating back to its introduction in the early years of white settlement. It has not been present long enough to have played a significant role in the evolution of reproductive biology of *D. kingianum*, but its activity in all parts of the distribution range makes it an important component in current and future reproductive events. *Trigona* is a common and well established native bee, regarded by entomologists as an immigrant from South America, arriving in Australia via floating logs. *Trigona* and *D. kingianum* are likely to have co-habited for considerable evolutionary time, and a detailed study of their interaction could be most rewarding. There may be other as yet unidentified bees which have been pollinators of *D. kingianum* for an even longer period, and these may also give clues to the evolution of *D. kingianum* diversity.

The relationship of bee pollinators to *D. kingianum* and to the other dendrobiums with which it forms natural hybrids requires further clarification. There is considerable variation in floral size of *D.* X *delicatum* (Bailey) Bailey, *D. speciosum* Sm., *D. gracilicaule* F. Muell., *D.* X *suffusum* Cady, *D.* X - *gracillimum* (Rupp) Rupp and *D. kingianum. Trigona* and *Apis* could serve as pollen vectors in this complex of natural hybrids. The major obstacle to study is finding pollinators at work. Much can be gained by collaboration with entomologists who can provide information about the habits and behaviour of bees, and strategies for locating them interacting with flowering plants.

Acknowledgements

We wish to thank Dr. Ken Walker of the Museum of Victoria for informative discussion, insect identifications and comment on the manuscript; and Dr. D.M. Calder for helpful discussion and encouragement.

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EDWIN DANIEL HATCH FLS

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This article has also appeared in the New Zealand Native Orchid Group's Newsletter No. 27, September 1988.

Readers of *The Orchadian* will be delighted to learn that Edwin Daniel (Dan) Hatch was elected a Fellow of the Linnean Society of London (FLS) on 24 May 1988, in the bi-centennial year of this prestigious, learned Society. Dan's election to the Fellowship is in recognition of a lifelong study of natural history in general, and the taxonomy of New Zealand native orchids in particular.

Dan Hatch was born in London, England, on 14 May 1919 and came to New Zealand with his parents in 1922. Right from his younger days he developed what was to become an abiding enthusiasm for botany, ecology and horticulture. In this he was greatly encouraged by his mentor, James Hunter, a horticulturalist and colleague of the eminent New Zealand botanist, Dr. Leonard Cockayne. Although he has had no formal education in botany, Dan Hatch learnt a great deal on the subject in his early years from the knowledge and experience handed on by his mentor, and from his growing collection of floras and other botanical books. Like many orchid enthusiasts, he is largely self-taught.

The Second World War proved to be a significant turning point in his life. From 1941-45 he served in the New Zealand Army and was stationed at the Waiouru Military Camp in central North Island. During his leisure hours when not studying accountancy, his professional occupation, he tramped, cycled (army issue push bike) and botanised in the surrounding hills and mountains, familiarising himself with the plants of the region with the aid of Cheeseman's *Manual of the New Zealand Flora* (1925) and Allan's *Handbook of the*

Naturalised Flora of New Zealand (1940). On these forays he collected a wide range of plant material for different specialists and 'developed an enduring interest in fossil botany'. He also discovered several orchids apparently new to science and thus began his study of native orchids in earnest.

At that time, Cheeseman's Manual was the authoritative work on New Zealand native orchids and no further systematic work had been undertaken since its publication in 1925. The then Director of Botany Division DSIR, Dr H.H. Allan, encouraged Dan to take up the study, sending him literature on the subject and the names of useful contacts both in New Zealand and abroad. From that time to the present Dan has been associated with a large number of orchid enthusiasts and others with an interest in botany and natural history. One of his earliest scientific papers, significantly in the *Proceedings of the Linnean Society of New South Wales* (1946), was published in collaboration with the Rev. H.M.R. Rupp of Sydney, himself a noted orchidologist. This paper dealt with the relationships of the orchid floras of Australia and New Zealand. In the same paper Rupp and Hatch erected a new endemic genus of New Zealand orchids – *Aporostylis* – and described several varieties of species in other genera. This "trans-Tasman" connection has been maintained over the years through Jones and Clements, to mention but a few. A recent product of this collaboration was published in the *New Zealand Journal of Botany* (1985) wherein Clements and Hatch have corrected the names of two endemic species of *Corybas*, based on a study of type material.

From 1945-54, Dan Hatch reviewed the native orchids of New Zealand in a comprehensive series of papers, illustrated with line drawings mainly by his father, and published in the *Transactions and Proceedings of the Royal Society of New Zealand.* This was the first substantive review of native orchids since Cheeseman's Manual and is perhaps Dan's most notable contribution in this field. In the course of this work he described several new species, including the curious endemic saprophytes, *Corybas cryptanthus* and *Yoania australis*, a dozen or more varieties and forms, and made many important decisions on the use and application of existing orchid names. To commemorate his contribution, a new endemic species of sun orchid, *Thelymitra hatchii*, was named in his honour by Dr Lucy Moore in the *New Zealand Journal of Botany* (1969). The flower of this particular orchid was selected as the emblem for the Second New Zealand International Orchid Conference in 1985. About 15 years later many, but not all, of the taxonomic and nomenclatural decisions made by Dan Hatch were sustained by Dr Moore in writing the orchid section for Volume II of the *Flora of New Zealand* (1970).

In addition to his 20 or so formal orchid papers, Dan has written over 60 other papers and articles for a variety of magazines, bulletins and newsletters, not only on his favourite subject, native orchids, but on other native plants and New Zealand botanical explorers. His "Brief comment on the orchids of New Zealand" was the first article in the first issue of *The Orchadian* in August 1963. Throughout his life he has given friendly encouragement to others and shown a willingness to communicate knowledge and information gained from a close observation of native plants, both in the field and in cultivation. In the Auckland Institute and Museum where he has spent many hours of study, as well as in other New Zealand institutions of learning, he has deposited a rich legacy of Australasian orchid specimens for the use of present and future generations of orchid enthusiasts.

Though now living in retirement at Laingholm, in the Waitakere Ranges in Auckland, Dan Hatch is maintaining an active interest in native orchids. With the help of his 45-year-old typewriter, he is still contributing articles to *The Orchadian* and the *New Zealand Native Orchid Group Newsletter*, as well as to other outlets. He is a fine example of a true student of natural history, and a worthy Fellow of the Linnean Society.

BECOME AN AUTHOR IN THE ORCHADIAN

Contributions to *The Orchadian* are always welcomed. You do not need to be a professional scientist, a botanist, taxonomist, or ecologist. All that is needed is a desire to communicate your knowledge to your fellow members of The Australasian Native Orchid Society and the readers of *The Orchadian.*

Articles from both professional and non-professional people are accepted. The subject can be conservation, culture, observations made on field trips, show results, descriptions of orchids in their native habitat, biographies of prominant orchid people, or any matter dealing with Australasian native orchids.

Send your contributions direct to: ANOS, P.O. Box C106, Clarence Street, SYDNEY, N.S.W. 2000.

A PUZZLING, PRECIOUS ORCHID

Trevor Prescott

The following article appeared in the *Geelong Advertiser* on 28 January, 1988, and in the *ANOS Geelong Group Bulletin* of April, 1988. It was brought to my attention by Walter Upton and Mrs. Margaret Wettenhall. I thank Mrs. Wettenhall for contacting the author and obtaining his permission to reprint the article in *The Orchadian* — The Editor.

Gunn's orchid, *Sarcochilus australis*, is an epiphytic plant of the high rainfall forests of Eastern Australia, from southern Queensland through New South Wales and Victoria into Tasmania. It is widely spread in the Otways, one of the few orchids adapted to life in the dense forests. Its survival there is due to its growth habit – as an epiphyte; it lives on the branches of other forest plants, often 20 metres or more above the ground, although many are found at much lower levels. Its host trees vary from the spindly currant-bushes (*Coprosma*) to the huge blackwoods whose trunks and limbs support a wonderful garden of lichens, mosses and ferns. Like those plants, Gunn's orchid uses the accumulation of leaf-litter and other forest debris on the host as its growth medium, and it develops a long, matted root system that utilises the nutrients and moisture trapped there.

The orchids get to their often-lofty perches when the seeds are blown on the winds that in autumn rush through the forest heralding the approach of winter. But orchid seeds are tiny, and will germinate only in the presence of a fungus living where they fall. In artificial cultivation, a special medium is prepared by the horticulturalist, but in the bush, it is naturally occupying. With some species, the fungus-orchid association is "species specific"; that is each orchid has only one fungus, or group of fungi, to assist the seed germination. A classic example of this is in an area of New South Wales where two closely allied *Sarcochilus* orchid species share the bushland, but each will grow only on certain plants – there is no record the two sharing the same host species, presumably because the hosts have different fungal associations which in turn have specific orchid affinities.

But with Gunn's orchid, a wide variety of hosts have been recorded in the Otways alone. Mr Paul Barnett of Carlisle River has made a study of the Otways orchids, and this was given a boost when he was commissioned to remove and re-locate all the orchids he could obtain from the Ocean Road re-alignment west of Apollo Bay. In all, several hundred orchids were carefully collected and re-planted in comparable forest clear of the Ocean Road ... but in doing so, Mr Barnett noted one surprising feature of them. Only a handful of them had any indication of having produced seeds. His knowledge of the plant in Tasmania was that a high percentage of the flowering plants set seed, yet in the Otways, it was no more than one or two in a hundred. The mystery was – why?

Gunn's orchid produces a minute pair of pollinia, or pollen sacs, which presumably attach themselves to an insect that visits the plant in search of nectar, and transfers them from flower to flower, ensuring pollination. Could it be that the pollinating agent is not found in the Otways? The identity of the insect – if indeed that is what it is – is apparently not known.

More puzzling is the origin of the Otway orchids seed if it is not produced in the forests there – could it be air-borne from Tasmania or perhaps from Gippsland where the plant is also known to seed prolifically? In an attempt to learn more about the orchid and its mysteries, I spent a few hours recently with Mr Barnett, Mr Geoff Beilby of the Colac Conservation, Forests and Lands office, and members of the Australasian Native Orchid Society checking a number of Gunn's orchids they have been monitoring in the Otways. Several flowers artificially pollinated by actually transferring the pollinia from one plant to another had set seed, so there is no evidence of infertility among the local plants. More than that, scores of young plants, some with just a pair of new leaves and quite tiny, were found there.

The thought that the orchid may set seed only every few years, not annually, was rejected because of the apparent range of ages of the plants – they appeared to be the product of successive years growth. It is an interesting puzzle that may take some time to resolve – meanwhile those fortunate enough to go into the Otways may find the plant there, but please leave them there. Unlike some other plants, they will not grow away from their living hosts, so to remove them and transplant them into a shade-house is to kill them. Quite apart from that, they are protected by law and a stiff fine will ensue if you are found with them in your possession.

READER'S FORUM

Culture of *Cymbidium suave*

Editor,

I was extremely interested in the article by Russell Job in the March 1988 issue of *The Orchadian*, on the culture of *Cymbidium canaliculatum* in earthen-ware pipes. Some years ago in a discussion with Charlie Taylor at an S.G.A.P. meeting, I was told *Cymbidium suave* was a very difficult plant to grow and would not last much longer than four or five years in a pot. Being inquisitive by nature and believing that "there is always a way", I decided to try my hand at growing this orchid, about which, at this time, I knew very little.

In 1973, I collected a small plant from a fallen branch of a dead tree somewhere in the Berowra area. One thing I noticed was that even a small plant had a very long root run, travelling quite a way into the branch. Looking around for something to take the place of a log, like Russell Job, I selected an earthen-ware drain pipe, but I found this had many disadvantages: (a) It was very heavy and would be difficult to transport to meetings, etc.; (b) To close one end, either the pipe had to be firmly dug into the ground or cemented over, which made drainage a problem; and (c) After growing in this type of container, would the roots adhere to the sides as they do in a terracotta pot? The only alternative was a plastic down pipe. This seemed to have none of the above disadvantages.

After removing the plant from the host piece of log, which required a considerable amount of cutting, I teased out the roots as much as possible without causing too much damage and slipped it into the pipe. As it was only a small plant, I used a 2 x 4 inch down pipe about 2 feet long, blocked off at one end with a piece of timber cut to size and drilled to provide drainage.

Medium? What did I use?? I had to have something that resembled the material inside a hollow tree. I had some very fine, not quite sawdust type of material from when I had chopped up *Casuarina* bark. This I mixed with a little rice hulls, peanut shells, and *Casuarina torulosa* needles; this looked pretty good.

Holding the plant just above the top of the down pipe, I scooped this mixture around all sides of the plant into the pipe, shaking it all the time so that the medium compacted in and around the roots of the plant. I filled to about one inch of the top and watered until the water was running from the bottom of the pipe.

The plant took to this like magic and never looked back. After about 3 or 4 years, the plant seemed to have out-grown this container so I repotted it into a 4 inch circular pipe giving it a little more root run. I didn't have any trouble removing it from the first pipe. I soaked it in a drum of water over night and after letting dry out for awhile it came out quite easily. Having had this plant for such a considerable time, I now have it in a 6 inch pipe nearly 4 feet long and last flowering it had 18 flower spikes. By drilling two holes through the top of the pipe and threading a piece of wire into them and then making loops at the end of the wire you can attach wire traces and hang the container from the roof or whatever.

Ian H. Carter,
47 Austin Avenue, North Curl Curl. 2099

NZNOG Newsletter No. 27

Max Gibbs (Taupo) writes (8 June), "Iwitahi survived 'Bola' but only just and the reserved area had quite a few trees knocked over. There is already a lot of leaf sign for both Caladenias and Thelymitras under the pines and the *Calochilus robertsonii* are all up about 10cm at the gum trees. The area being cleared by Timberlands has been logged and burnt and is a blackened wasteland. The orchids transplanted from this area appear to be OK so far and some potted specimens in my shadehouse have produced new growth, e.g. *Corybas acuminatus* is confirmed as the plants are through and are sporting flower buds. ..."

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AUSTRALIAN WILD FOODS: GROUND ORCHIDS - SALUTE TO SALOOP

by Tim Low

This article was drawn to my attention by Neville Howcroft and was published originally in *Australian Natural History* 22: 202-203 (Winter 1987) — The Editor.

Ground orchids are enchanting plants. Each spring they brighten the forest floor with dainty blooms of the oddest colours and shapes. Enjoy them while you can, for they flower but fleetingly; each summer the leaves, stems and flowers die away.

My fascination with ground orchids blossomed last spring, during a long-term study of the traditional foods of Aborigines. Most ground orchids produce 'tubers' and early colonial writers listed these as Aboriginal foods. For years I paid them no heed, for I encountered ground orchids infrequently and the tubers I dug up were tiny. But then I came upon an intriguing article on Aboriginal diet by Melbourne botanist Beth Gott. She wrote:

"Accustomed as we are to the total protection of orchids in most states of Australia, we tend to dismiss the *Orchidaceae* (orchid family) as an important food source, considering them to be rare; yet orchids are widespread, even in quite dry areas, and are often locally abundant. They were widely exploited as a food source."

Beth wrote of finding Nodding Greenhoods - *(Pterostylis nutans)* at the extraordinary density of 440 plants per square metre, yielding 800 tiny tubers, although with a combined weight of only 126 grams. Orchid tubers are easy to dig and, at densities like this, could serve as important foods.

I began to look out for orchids, and last spring reaped a bountiful reward. It began on a small knoll in southern Australia where I chanced upon four orchid species flowering side by side. The first, a Common Waxlip (*Glossodia major*), sported a single egg-shaped tuber with a pointed tip. This tuber tasted watery and slightly sweet, with a bitter aftertaste. It was not nice. The second, a Leopard Orchid (*Diuris maculata*), had two bullet-shaped tubers 3 cm long and 6 to 7 mm wide, with a glutinous sticky taste. The arrowroot-like starch, although filling, stuck cloyingly to my gums. The third orchid, a Tall Greenhood (*Pterostylis longifolia*), had a pair of globular tubers, 12 mm broad, with a watery bitter taste. The fourth orchid, Pink Fingers (*Caladenia carnea*) had two pea-sized white tubers, tasting sweet and juicy.

I was intrigued by this hilltop orchid entree. The tubers of these four plants were as varied in flavour and form as were the flowers in colour and shape. Although some of the tubers were not appealing, together they afforded a most interesting wild food snack.

Since then I have sampled the tubers of 12 genera and more than 20 species of ground orchid. Some were quite unpalatable although all were obviously edible, and a few were exceptionally tasty – especially the walnut-sized 'potatoes' of Brown Beaks (*Lyperanthus suaveolens*) and the fragrantly flavoured starch of the Horned Orchid (*Orthoceras strictum*). Most filling were the glutinous tubers of donkey orchids (*Diuris* spp.) and sun orchids (*Thelymitra* spp.) and I have no doubt that these were important Aboriginal foods.

Although most of the tubers were tiny, those of the common Hyacinth Orchid (*Dipodium punctatum*) were big. One plant had six long tubers, each between 7 and 8 mm thick and longer than my fingers. The tubers were watery and, for an orchid, unusually fibrous although less so after cooking. These 'tubers' are actually large fleshy roots, which accounts for their fibrous texture. These were the only orchids that required cooking to improve the taste; the others I was able to eat raw.

Incidentally, Hyacinth Orchids are mysterious plants. Lacking leaves, they grow only beneath certain kinds of eucalyptus and are said to be parasitic on a fungus. They seem to have the largest tubers of any ground orchid, apart from those of Cinnamon Bells, also called Potato Orchid *(Gastrodia sesamoides)*, another leafless saprophyte, once eaten by Aborigines in Tasmania.

Hyacinth Orchids flower through summer but most orchids bloom in spring, which is when the leaves appear. Ground orchids are not very leafy plants, and many produce only a single leaf, others two or three. These soft, succulent leaves cannot withstand the scorching summer sun, and the plants 'gestate' through summer in the form of those starch-filled tubers, so important as foods.

Tuber-producing is a common tactic of small plants with soft leaves growing in a harsh climate with seasonally dry soil. Besides orchids, many of the smaller lilies and the Murnong or Yam Daisy - *(Microseries scapigera)* depend on tubers. These plants often grow together in shallow soils and Aborigines no doubt harvested them in large numbers.

The tiny tubers could have served as staple foods in spring, when these plants are in flowers, but I was curious to know if Aborigines would have harvested them in other seasons, when the plants are less obvious.

At first it seemed unlikely. Last October, in the granite mountains near Stanthorpe, I found colonies of Brown Beaks within which only half the plants were flowering, This orchid has a single leaf remarkably similar to Blady Grass (*Imperata cylindrica*), and both plants often grow together so that the orchid is extremely difficult to locate without its flowers. On open ground the leaf is noticeable but still easily over-looked. Could Aborigines have gathered an orchid like this outside the flowering season?

Last summer I stumbled upon the answer. I was photographing Hyacinth Orchids in disturbed bush in suburban Brisbane where, surprisingly, this orchid is locally common. Many of the orchids were past flowering, and I took note of their distinctive oval capsules. Two weeks later, in South Australia, I was tramping through the hills behind Adelaide when I spotted a similar egg-shaped capsule on a dried stalk. Could this be an orchid? I clawed into the dirt and, to my astonishment, unearthed a shiny white tuber shaped like a grape. This came from no Hyacinth Orchid but was obviously of orchid origin. Its crisp white starch tasted sublime. Excitedly I scanned the nearby forest and realised there were dozens of these dried pods, all signalling tiny stores of food hidden in the hot earth. These tubers were so common that a forager could have lived happily off the land. The different shapes and tastes of the tubers confirmed that several orchid species were present.

Elsewhere in south-eastern Australia it was the same. In southern Victoria, in coastal New South Wales, wherever I looked I found tubers – sometimes by spotting a dainty flower but more often by finding dried capsules in the wiry grass. Occasionally I made a mistake, confusing the capsules of trigger plants (*Stylidium* spp.) with orchids. But there could be no mistaking the significance of my find – that, for the Aborigines, orchids were a source of sustenance all year round.

Ground orchids are no longer on my menu. I cannot justify the continued harvest of these beautiful plants. Nor would I want others to follow my example. Orchids are protected in some States, and rightly so. There is, however, an interesting appendix to my tale. During my reading on orchids I came upon several old references to white people eating the tubers, both here and overseas.

Consider the following comment by colonial Australian botanist Joseph Maiden, writing in 1898:

"There is hardly a country boy who has not eaten so-called Yams, which are the tubers of numerous kinds of terrestrial or ground-growing orchids."

Even more surprising is Anne Pratt's description of 'salep' (orchid starch, also called saloop) in her 1891 book *Flowering Plants, Grasses, Sedges and Ferns, of Great Britain*:

"Salep is little used now in this country; but less than a century since, the Saloop-house was much frequented, and the substance was a favourite repast of porters, coal-heavers, and other hard-working men. It is said to contain more nutritious matter, in proportion to its bulk, than any other known root, and an ounce of salep was considered to afford support to a man for a day; hence those who travel in uninhabited countries have greatly prized so portable a vegetable food."

AUSTRALIAN NATIVE ORCHID HYBRIDS

(New registrations by the R.H.S. from lists in the Orchid Review, July — September, 1988.)

NAME	PARENTAGE	REGISTERED BY
Dendrobium		
Peter Starr	Peter Hewitt x *tetragonum*	R. & D. Sheen
Plectochilus		
Kilgra	*Sarco. falcatus* x *Plrhz. tridentata*	S. Penman

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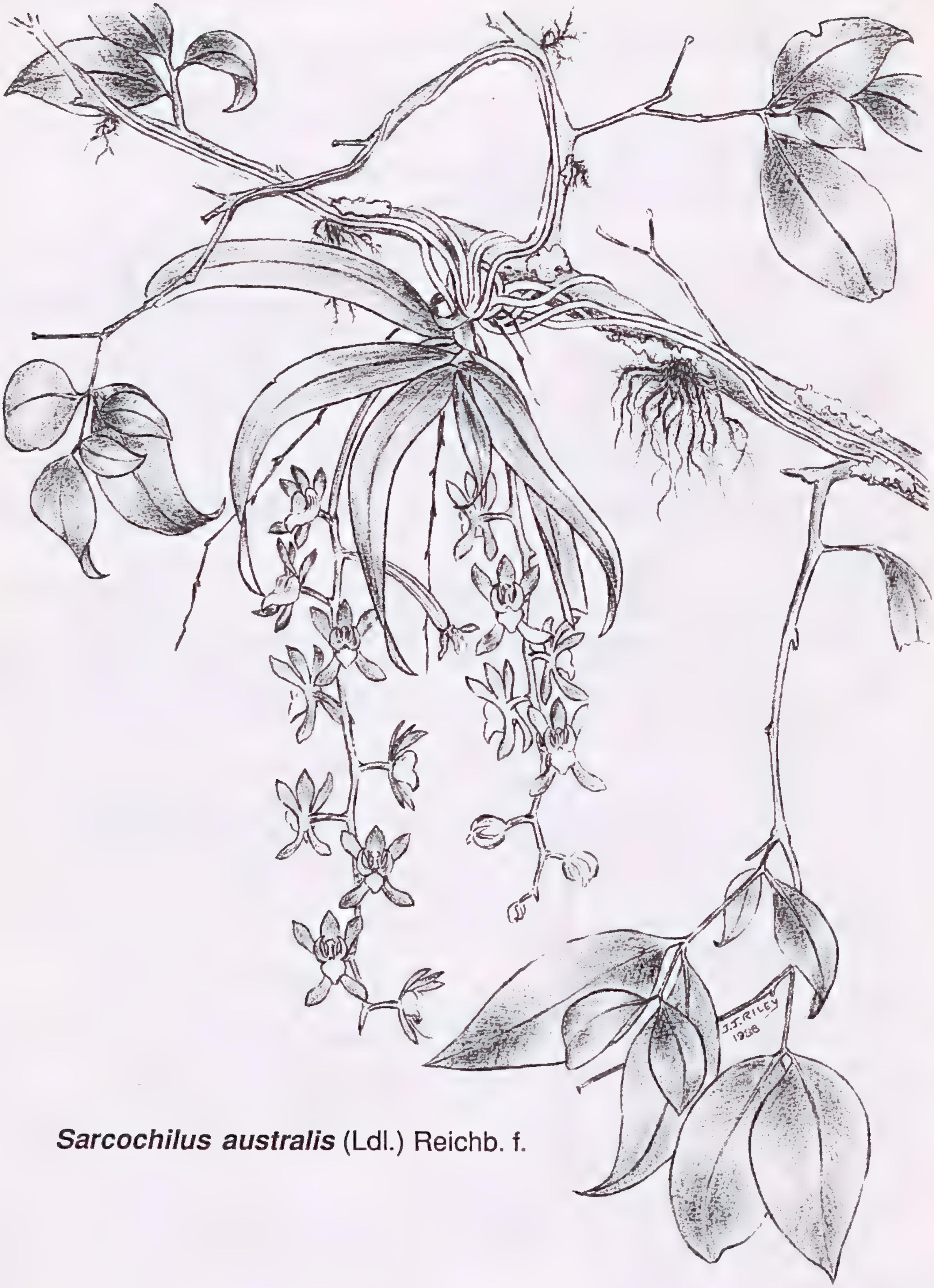

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EDITORIAL

Hobbyists often accuse taxonomists of unnecessary fiddling with the names of their beloved species. Just why the hell do they keep changing the names! And why can't they use the same name as printed in Sander's Lists!

Such a cry can now be heard from the growers of Australasian native orchids with the recent publication of books by David Jones (*Native Orchids of Australia*) and the ANOS Victorian Group Inc. (*Cultivation of Australian Native Orchids*) which follow the new names and taxa set down in Mark Clements' soon to be published *Catalogue of Australian Orchidaceae.* The situation is confused further by the use of different names for the same species by *Sander's List of Orchid Hybrids* and Clements. Even though we criticise the actions of taxonomists, we should realise that there are usually very good reasons for the name changes.

The first thing to remember is that taxonomists like Clements and Jones must follow strict rules laid down by the International Code of Botanical Nomenclature (ICBN) when they choose names for the species they describe, while The International Registration Authority for Orchid Hybrids (IRAOH), the authority behind Sander's Lists, may choose to follow what is called the Horticultural Code and use names of horticultural importance rather than strictly correct botanical names. Thus, we have *Dendrobium discolor* as the botanically correct name (by the ICBN rules) for a species which the IRAOH calls *Dendrobium undulatum* in the registration of hybrids.

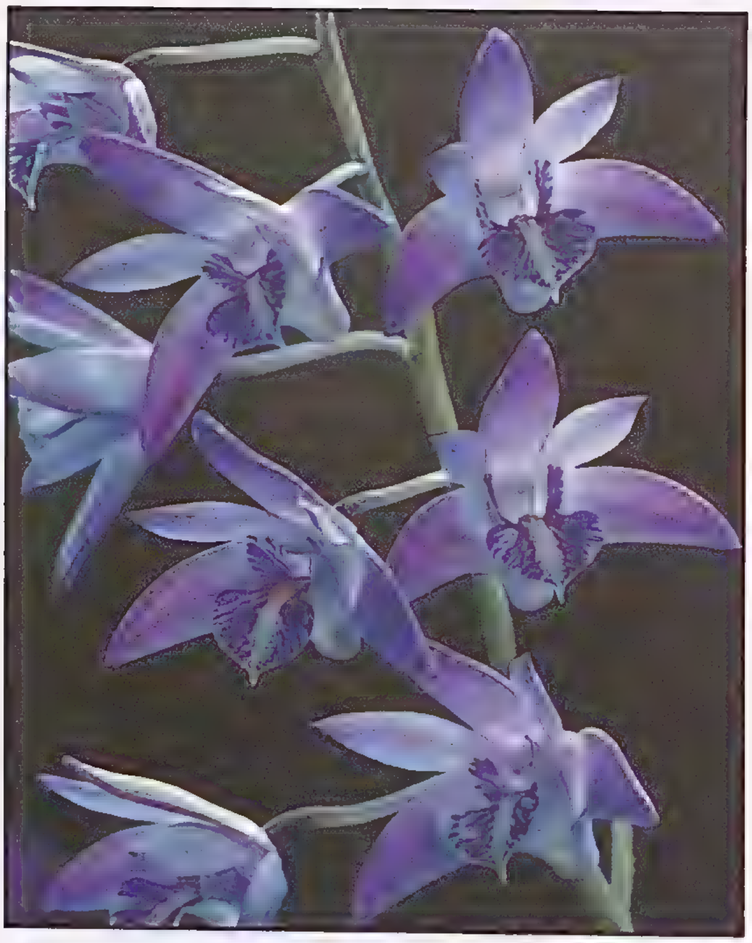
The ICBN rules are very strict about the aspect of priority in naming orchid species. As the historical literature becomes more well known, taxonomists discover earlier names for species which we have long known by a different but later published name. Provided the earlier name was correctly published and does not contravene any ICBN rules, the earlier name has priority and must be used. It is this rule of priority which seems to have caused a number of name changes for Australian native orchids. Thus *Dendrobium jonesii* is the correct name for *Dendrobium ruppianum* because Alfred Rendle published the first name some 60 years before Alex Hawkes published *Dendrobium ruppianum.*

A more confused situation occurs when an incorrect name is assigned to a species which has been correctly described under another name. This situation has arisen with *Dendrobium bowmanii, Dendrobium mortii* and *Dendrobium tenuissimum.* When Clements examined the type specimens (the herbarium sheets containing the plants used in the original description of the species) of *D. mortii* and *D. tenuissimum,* he found that they were the same species, while the species known for so long to hobbyists as *D. mortii* had been described as *D. bowmanii.* Because the name *D. mortii* had been published some 80 years before the name *D. tenuissimum,* it takes precedence over the latter name.

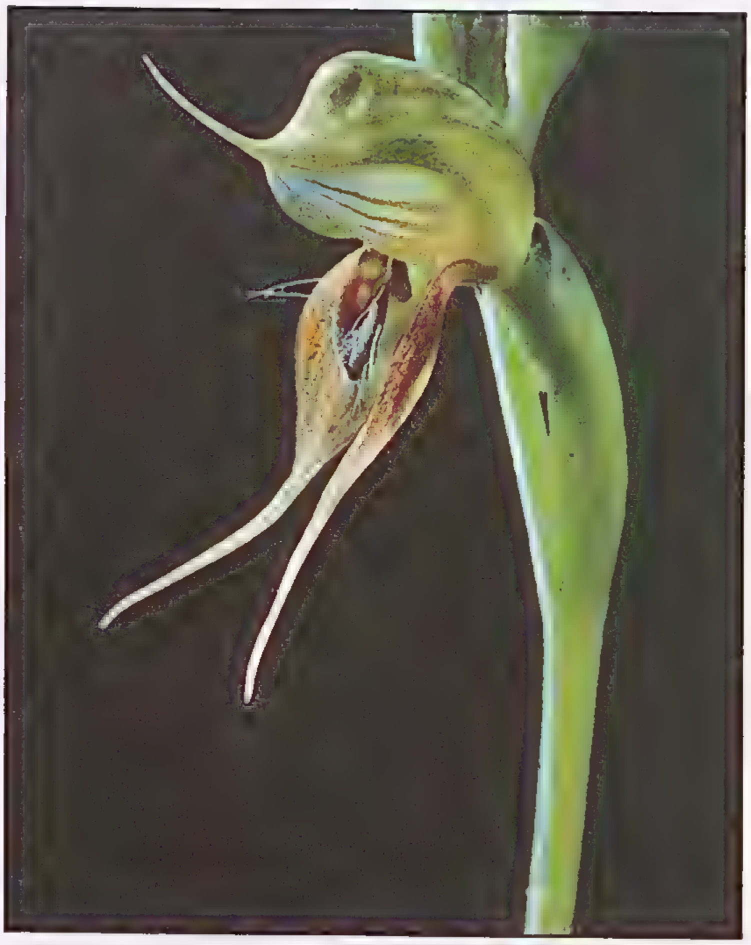
As taxonomists learn more about the complex interrelationships between members of the orchid family, regroupings or new divisions sometimes become necessary. Such actions have given rise to taxonomists being branded as 'lumpers' or 'splitters'. The 'lumpers' would have us believe that *Dendrobium bigibbum, Dendrobium phalaenopsis,* and *Dendrobium schroederianum* are the same species, while the 'splitters' class them as different species. In his catalogue, Clements extends the lumping commenced by Steve Clemesha who reduced *D. phalaenopsis* and *D. schroederianum* to subspecies of *D. bigibbum.* However, he has apparently split a number of species which had well known varieties into new species. Thus *Dendrobium speciosum* has been spilt into *D. speciosum, D. tarberi, D. nitidum, D. curvicaule, D. pedunculatum,* and *D. rex.*

Only time and further study will tell whether such lumpings and splittings are correct and acceptable to the majority of fellow taxonomists.

Noel J. Grundon

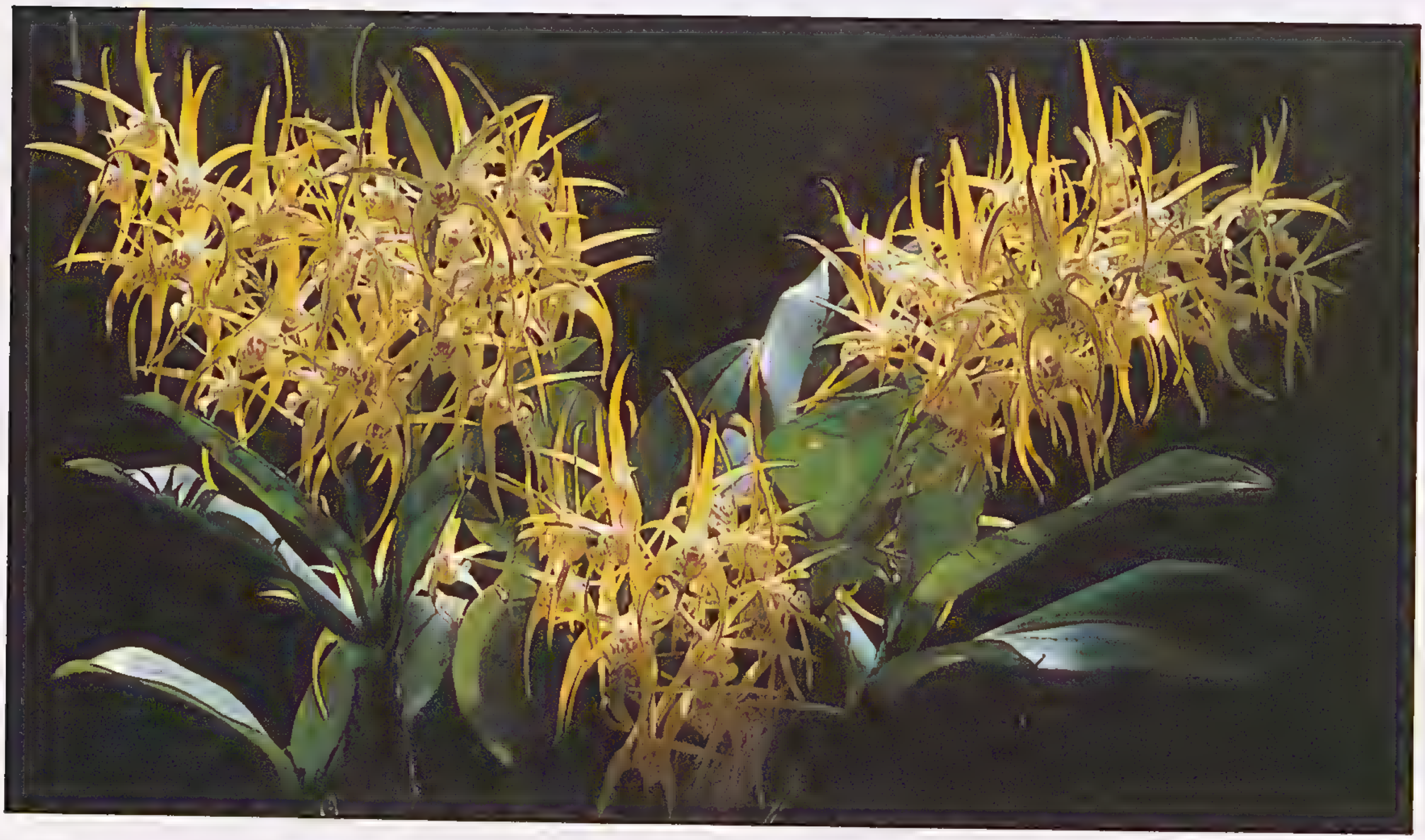


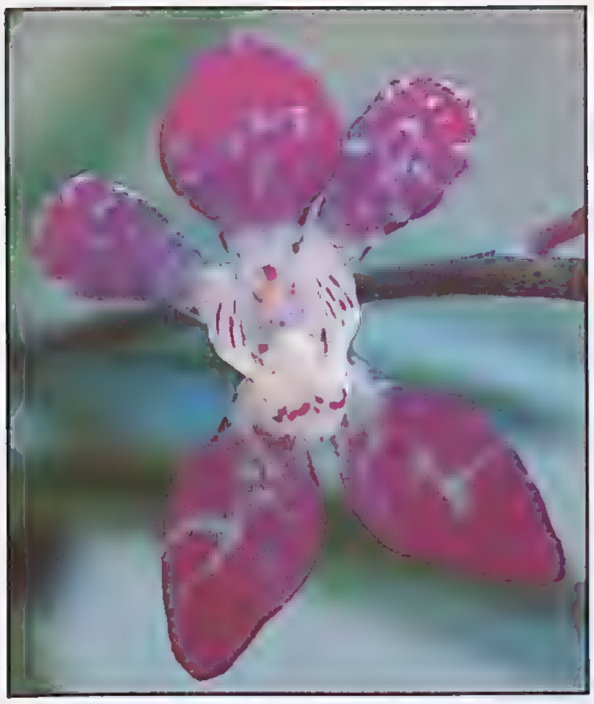
Dendrobium kingianum (See Pages 122 & 132)
Growers L. Montuoru & M. Mc Tiernan



Pterostylis mitchelli (See Page 122)
Grower P. Eygelshoven

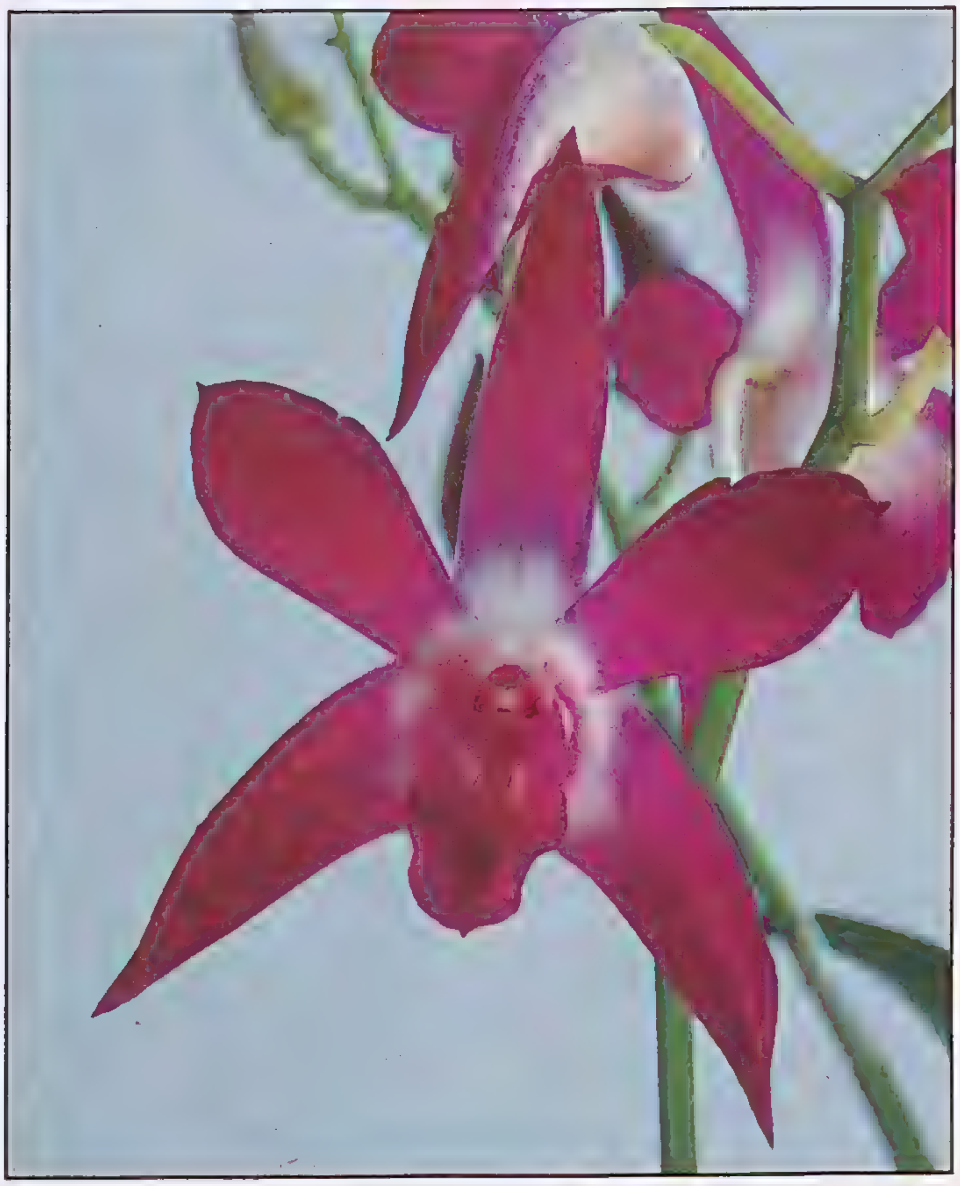
***Dendrobium* Hilda Poxon 'Mt Ida'** (See Page 123)
Grower S. Batchelor





Sarcochilus* Mavis x *S. australis exhibited by Daryl Smedley which won the first flowering seedling section at the ANOS Sydney Group Show. (See Page 137)

The plant that took Sydney by storm ***Dendrobium* Elegant Heart 'Warringah'** exhibited by Wal & Jill Upton. (See Pages 123, 125 & 138)



All photos by Mark Webb.

These colour pictures were made possible by a grant from the Australian Orchid Foundation.

SHOW REPORTS

ANOS SYDNEY GROUP

Spring Show

This year's mild winter brought many native orchids into flower earlier than normal, and Sydney Group's decision to stage a show at the beginning of September (Sunday 4th), rather than later, was a stroke of brilliance, or was it just good luck.

Dendrobium speciosum
Grower B. Fletcher
Photo: M. Webb

Excellent conditions for *Dendrobium speciosum* provided a full bench of this magnificent orchid, with blooms ranging in colour from pure white through to good strong yellow. Most plants were the type variety, var. *speciosum*, but there were also a couple of var. *hillii* and var. *curvicaule* for contrast. Bernie Fletcher's *D. speciosum* var. *speciosum* stood out as the best. It was a good clear yellow, with large open flowers, well displayed on an arching spike. After winning its section, this plant went on to be judged Champion Species Orchid for the show, an indication of its superior quality and appeal.

Dendrobium kingianum was well represented and a number of good clones were benched. Lou Montuoru and Michael McTiernan's beautiful bicoloured form was first in this section. Characterised by widely opening, lilac flowers with a contrasting dark purple lip, this plant showed that not every good *D. kingianum* is a dark red one.

A fine display of *Dendrobium tetragonum* was a real feature of the show and examples of all four varieties were present. The most impressive of these were the so-called 'NSW north coast' forms, with large bronze/orange flowers and broad labellum. These plants really stole this section, although a couple of the pure green form from highland North Queensland were also greatly admired.

Dendrobium teretifolium* var. *fairfaxii
Grower R. Phillips
Photo: M. Webb

In terete-leaved *Dendrobium* section, a number of well-established *D. teretifolium* showed just how well this species performs in cultivation. A very well flowered form of *D. teretifolium* var. *fairfaxii* benched by Roger Phillips was considered by the judges to be the best, but it only just beat a very nice *D. pugioniforme*.

The count was down somewhat in the *Sarcanthinae* species sections, due to the early date, but several earlier flowering types were there. A few nice *Sarcochilus falcatus* caught the eye, along with such botanicals as *Papillilabium beckleri* and *Pteroceras spathulatus*.

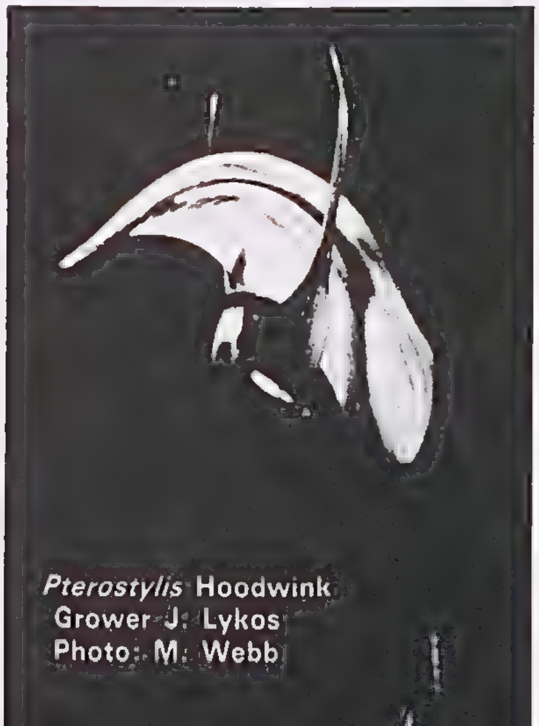
A good variety of spring-flowering terrestrial species were on exhibit. *Pterostylis baptistii, P. bicolour, P. mitchelli* and *P. pedunculata* were top quality, as were *Diuris punctata* var. *punctata* and *D. pedunculata. Caladenia dilatata* and *Glossodia major*.

There were some excellent hybrids on the showbench but all were eclipsed by Wal Upton's superb *Dendrobium* Elegant Heart. One judge was heard to remark that ANOS does not judge cluster cattleyas, and it was true that this native hybrid was approaching the size and appearance of such exotics. The vibrant cerise flowers were borne on upright spikes on a medium sized plant, and averaged about 80 mm tall. With broad segments, a generous labellum and an open, symmetrical shape, they impressed all who saw them. There can be no doubt that there is a great future for this type of hybridising between our tropical and temperate species, and if this plant of *Dendrobium* Elegant Heart is a fair representation of what is achievable, then it is reasonable to say that the future of hybridising within Australian native orchids lies in this direction.

A number of other good hybrids were also on show. Sid Batchellor's *Dendrobium* Hilda Poxon 'Mt. Ida' was an absolute picture, the epitome of a healthy, well-grown native orchid. It was awarded Champion Specimen Plant, and deservedly so, for it carried five erect, slightly arching spikes of bright yellow flowers, all in prime condition. Other notable hybrids were *D.* Star of Gold 'Bathurst', *D.* x *suffusum* 'Gold', and *D.* Hilda Poxon x *D.* Golden Fleck.

All things considered, this year's ANOS Sydney Group Show was a success. It was not as big a show as we have enjoyed over the past few years when we were part of the annual SGAP Castle Hill Show, but it was, nevertheless, a fine display of Australian native orchids.

Michael Harrison



Pterostylis Hoodwink
Grower J. Lykos
Photo: M. Webb

ORCHID EXPO '88

To coincide with World Expo '88 held in Brisbane, the Sub-Tropical Orchid Council, Queensland, hosted the Orchid Expo '88 Conference and International Orchid Show at the Civic Cultural Centre, Caloundra, from 8th to 12th September. The setting was magnificent; under one roof was a large show hall, a secondary hall for commercial displays, an auditorium seating over 500 people, full catering facilities for lunch, dinner, and morning and afternoon teas, a bar, and an underground car park. The organisation was outstanding; the lectures believable; the displays breathtaking; and the orchids sensational. It all came together to provide one of those unbelievable, once-in-a-lifetime experiences. Allan Pearce, Chairman of Orchid Expo '88, Brian Pearce, President of the Sub-Tropical Orchid Council, Queensland, and their many, hardworking helpers deserve all the accolades for staging a truly memorable event.

And the native orchids did not let us down. Although the overall standard left something to be desired, there were some truly outstanding plants tabled and it is on these plants that I will concentrate in this report.

Champion Australian Native Species or Hybrid was an outstanding form of *Dendrobium* Our Native owned by L. & S. Grubb. The plant carried four erect racemes of large, showy, pure golden yellow flowers with only slightly twisted, wide segmented, petals and sepals. Sander's lists this hybrid as *D. johannis* x *D. speciosum*, but both the owners and the hybridizer confirmed that this plant was from a remake of the hybrid using a good form of *D. speciosum* var. *grandiflorum* and the plant we now know as *D. trilamellatum*. On the basis of this information, the improved, superior form of this plant can be understood; and it would be more correctly classed as an as yet unnamed hybrid.

All three prizes in the *Dendrobium kingianum* section were won by T. & B. Gregory. First prize went to a first flowering seedling carrying only three racemes on about six bulbs, with each raceme carrying four to five flowers of exceptional size and width of segments, a good even pink colour, and well rounded tips to the petals and sepals. Second and third prize winners were plants from the Gregory's breeding programme, clones 'Silky' and

***Dendrobium speciosum* 'Glen'**
Grower R. Burns
Photo: W.T. Upton

'Gloucester Pink', each plant showing the outstanding culture these people have achieved with this group of orchids.

A very good, dark maroon red form of *Cymbidium canaliculatum* var. *sparkesii* owned by G. & M. Gamble won the native *Cymbidium* class. A well flowered specimen of *Dendrobium ruppianum* owned by R. Crane carried wide opening, white flowers with wide segments to win first prize in the Other Epiphytic Species class. In the Any Other Hybrid class, all three place winners deserved first prize. Winner was a magnificent *Dendrobium* Rachelle Simpson 'Queenslander' HCC/QOS owned by S. Heyden and carrying two 20–30 cm tall spikes staked upright. Second was a very good form of *Dendrobium* Peter, showing outstanding flower size and width of segments, and owned by J. Hazelwood. D. Loch owned third prize winner, a first flowering seedling from a remake of *Dendrobium* Lowana Nioka showing bold carriage of extremely clean coloured flowers of better size than either parent.

Noel J. Grundon

CENTRAL COAST GROUP

8th Annual Show

On the same day as the Mona Vale Show, I rushed up to Gosford to see the Central Coast Groups 8th Annual Show, and I am particularly pleased that I did, because the whole show was a pleasure to behold.

The Scout Hall was absolutely packed with top quality native orchids, and the aroma was superb. There is no doubt about it, the Central Coast Group do things in a big way, even afternoon tea was served on their own specially designed tablecloths, with special serviettes too.

The Grand Champion was a very good form of *Dendrobium speciosum* var. *speciosum* belonging to Reg Burns, its clonal name was 'Glen'. It also won the Best Species. A good shaped plant with long racemes, each carrying about 80 flowers of good shape, size, and colour. The Reserve Champion was an excellent *D. falcorostrum* belonging to J. Andrews, a plant anyone would be happy to take home. The Best Hybrid was a particularly good *D.* x *delicatum* owned by R. & S. Barrett. The winners of the First Flowering Hybrid Seedling class was also R. & S. Barrett, the plant was a well grown *D.* Golden Glory of good colour, size, and shape.

The Best Species Seedling First Time Flowering was a *D. kingianum* owned by Ian Slade. The improvement made in sibling crosses of our species is very noticeable, and the results are far superior to anything seen in its natural habitat.

Among the species and natural hybrids exhibited were many large and well flowered plants, all a credit to their owners. The *Sarcanthinae* orchids were there in large numbers and also of high quality. The Best *Sarcochilus* was won by B. & D. Parker with a superb *S. hartmannii.* The Other *Sarcanthinae* and *Sarcochilus* Hybrid classes were both won by Alan Peck. The hybrid was *S.* Elizabeth; of good shape and size; the future augers well for this genus.

Next year, don't miss this show. It's a must for any native orchid lover.

Walter T. Upton

ANOS VICTORIAN GROUP INC.

Spring Show 1988

With the renovations and rebuilding of the National Herbarium building at the Royal Botanic Gardens, the Australasian Native Orchid Society Victorian Group Inc. moved its annual Spring Show into marquees in the grounds of the nearby Astronomer's residence.

Amid worries over suitability of using marquees and the changed locations, a willing band of members transformed a bare tent into a magnificent demonstration of the beauty of Australia's native orchids. The longer than usual warm period through summer/autumn 1987 had shown its benefits as the display of flowers was one of the best for many years.

Included were well flowered examples of most of the forms of *Dendrobium speciosum*, from deep rich yellows through creams to whites, with an almost overpowering perfume to match. These were arranged around a pool and waterfall centrepiece together with a well grown and flowered *Dendrobium striolatum* and several magnificent specimen *Sarcochilus*. Contrasting flowers of red, pink, cream, yellow, and white from *Dendrobium kingianum*, its hybrids (*D.* Ellen, *D.* Bardo Rose, and many other newer crosses), and the hybrids of other species(*D.* Jamie Upton) completed the epiphytic display on two walls of the tent.

The third wall was devoted to our terrestrial gems and the gains in cultivation as described in our newly released second edition "Cultivation of Native Orchids" could be seen everywhere. Incredible potfuls of spidery *Caladenia* from Western Australia, *Lyperanthus suaveolens* with over 80% flowering success, and the striking yellows of the *Diuris* being the highlights.

Whilst the Society does not formally judge its orchids, outstanding culture is recognised in the awarding of cultural certificates. As an indication of the standard of exhibits, in 1988, 12 certificates were awarded, more than double the number in any previous year. As well, three prizes are awarded for the Best Cultivation in three sections: Best Cultivation of an Epiphytic Species (Bill Murdoch Trophy) was awarded to Andrew Jackson for *Dendrobium gracilicaule*; Best Cultivation of a Terrestrial Species (Phil Maims Trophy) was won by Malcolm Thomas for *Caladenia huegelii*; and Best Cultivation of a Hybrid was awarded to Bruce Harris for *Dendrobium* Jamie Upton.

The final highlight of the show was a fine display of the artistic talents of members Helene Wild and Velda Ellis in watercolour paintings of our orchids. Many of these paintings found homes amongst visitors to our show.

Congratulations to all who participated, growers and workers alike, for a magnificent show.

Dean Shannon

MONA VALE SPRING SHOW 1988

The 14th Annual Warringah Group Spring Show was held at The Mona Vale Memorial Hall over the weekend of the 10th and 11th September 1988. Attendance at the show was approximately 1300 not counting pensioners and children who were admitted free. This was well down on previous years and it was unfortunate that the weekend coincided with the Rugby League Grand Final being televised live on television.

The Mona Vale Spring Show is one of the highlights of a native orchid growers year. The perfume in the hall is overwhelming; the sight of a large hall filled with orchids, the size of some of the huge specimen plants, and the massed displays put on by some members are experiences that will always be remembered.

There were three displays in the Large Display Section and Chris Arnott's lone entry in the Small Display Section. I feel that the displays are the centrepiece of any show. ANOS Wollongong Group won first prize in the Large Displays. Their display contained some fine *Sarcochilus* specimen plants, especially a plant of *Rhinochilus* Dorothy with six racemes of flowers approximately 30 cm long. Mosses and moss covered rocks enhanced their display superbly. Second prize for displays was won by Wal and Jill Upton. Their display was a mass of flowers with the centrepiece being a plant of *Dendrobium* Elegant Heart. This plant won the Champion Native Hybrid Orchid – ANOS Silver Medal of the show. *D.* Elegant Heart also won its section at The Australian Bicentennial Orchid Festival Show held at the Sydney Domain two weeks later. Ron Gallagher and John Roberts have been

(continued on page 132)

FROM THE BACK OF THE BUSHHOUSE

N.H.S. Howcroft

Forest Research, P.O. Box 134, Bulolo, Papua New Guinea.

Neville Howcroft is our Editorial Associate for Papua New Guinea. In so far as Australasian orchids are concerned, he lives at what might have been the evolutionary centre of the *Dendrobium* and *Bulbophyllum* genera. In his backyard is a bewildering range and diversity of orchid species, including over 300 species of *Dendrobium* alone. It is only in the last 100 years that many of these orchid species have became known to science. In this article, Neville tells us something of what is currently happening orchidwise in the eastern half of this extraordinary island of botanical wonders – Editor.

The orchid world of Papua New Guinea was a very active one when I first arrived just over 23 years ago. It was not difficult to meet up with people who were collecting and cultivating both indigenous and exotic species. A strong interest in orchid taxonomy existed. For import and export activities, there were very few difficulties involved and the foundations for a local orchid industry were being established.

Today the scene has changed considerably. Many of the orchid growers that I once knew have left and the growers that are rumoured to exist are difficult to contact. Orchid exporting has almost stopped except for the legal export to botanic gardens and some illegal exporting of plants which, in some cases, appears to have been done more out of ignorance than otherwise. A flora conservation committee which is concerned with the identification and protection of endangered plant species, has been formed within the ranks of the Papua New Guinea Botanical Society. The orchid projects, started as a basis for a local industry, still exist. Taxonomic studies of the orchids continue and there are new species and natural hybrids to be described. There is a rumour that, in Port Moresby, there is a book in the making that will be an updated version of Andree Millar's work (Millar 1978).

Orchid Export

On a number of occasions, I have had requests from friends and strangers, for orchid plants and other genera. These requests have been sent to the Officer-in-Charge of the National Capital City Botanic gardens in Port Moresby. In all cases, these orders could not be fulfilled. In some cases, people have actually taken plants out on permit only to have them confiscated at the other end. The only people that have succeeded in taking plants out are those who have the approval of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) such as well known botanic gardens, and those who adhere to CITES requirements. The latter usually means that the plants going out of the country must have government approval and that CITES is satisfied that those plants are not on the list of endangered or rare species. At present, no live native orchid plants should be leaving this country for the hobby or commercial grower.

On Matters of Conservation

A list of orchid species that require protection of the first order, has yet to be completed. It is not an easy task because the distribution of many species, and their habitat requirements, are not well known. However, what is known is that some plants are endangered in parts of their natural range. For many, the problem is habitat destruction by gardening activities, agriculture, and reforestation projects, as well as straight forward natural disasters such as land slips, droughts, and fires. I have seen masses of *Oxyglossum Dendrobium* growing on a 7 year old road side cutting, but two years later they had all totally disappeared. Today, they are slowly reappearing. There is a good seed source somewhere. Habitat destruction could possibly be best illustrated by the slow disappearance of *D. tangerinum* from certain parts of the Markham/Ramu valley junction due to the removal of the host tree *Neonauclea* to make more room for cultivation. The species does occur elsewhere, but it is threatened in this part of its natural range. Is this excuse enough for total protection?

Some species are vulnerable to over-collecting, and at present, there are none more so than the slipper orchids. In late October this year, Dr. Dietrich Jelden, scientific authority for CITES, visited Bulolo to view the Butterfly farming and insect trading establishment here and, more by chance, met with me to discuss, briefly, the protection of native orchids and the illegal export of live native orchid plants. Of particular concern was the export of *Paphiopedilum* from their native habitats despite their listing as protected species. Germany has a complete ban and, according to Jelden, quite a number of illegal imports have been confiscated there and dispersed to botanic gardens. The *Paphiopedilum* figured prominently among the confiscated material and these included several species of Papua New Guinea slipper orchids such as *P. bougainvilleanum* and *P. wentworthianum.*

Orchid Projects and Collections

In August, I was able to visit three projects in the highlands. The first, situated at Laiagam in the Enga province, was established by Tom Reeve who now resides in Australia. It is an extremely valuable collection of highland orchids, Rhododendrons, Begonias, Balsams and other native flowering plants. The collection is of scientific and horticultural importance and fortunately has been well looked after by provincial D.P.I. and Forestry staff. This collection is worth a visit as it contains native species not seen or rarely seen in cultivation. The Laiagam project has the facilities to carry out seed propagation and this possibility has been discussed with the authorities responsible for the welfare of the project. These people identified what seemed to them to be two problem areas, trained staff to handle the flasking and marketing. I personally do not see these as major obstacles.

The second project inspected is located in the same province, just a half hours drive from Wabag, at the Kaiap Orchid Lodge. The Lodge is located at around 3,000 metres above sea level, on a ridge that allows one to view the spectacular scenery of the Lai and Ambum valleys. The Lodge is locally owned and attracts visitors from around Papua New Guinea and overseas. The house is two-storied and made of bush material. The rooms are a bit small, with two beds and a sliding door. Nevertheless, they are warm, clean, and comfortable for the visitor. The meals also are good and I feel sure that, for the equivalent price of around $50.00 (kina 36.00) for full board, the visitor will get his money's worth.

Andree Millar was very much involved with the establishment of the Lodge and its orchid gardens which contain a good range of local species, including some extra large flower forms of *Dendrobium cuthbertsonii.* Unfortunately, it appears that plants have been sold from here to overseas growers and fairly recently. The assistant manager was not aware of CITES or the bans that have been imposed on the trading of native plants without the approved authorisation. He did not seem to know if the plants reached their destination.

The third project is run by a former employee of Tom Reeve's, Mr. John Tari. This collection is housed on D.P.I. ground adjacent the Forestry Department offices at Mendi, in the Southern Highlands Province. John is an enthusiastic orchid collector and he has put together a fine collection of orchids from the Southern Highlands. This collection also includes a good representation of *Paphiopedilum praestans.* The orchid collection and John will possibly be transferred to the Department of Forests in the near future. Of note was the presence of a laminar flow cabinet in the newly erected Mushroom Laboratory, adjacent to this collection. Such a laboratory and equipment could be used for the culture of orchids from seeds as well as for mushrooms. Staff would need to be trained and this was briefly discussed with the Officer-in-Charge of the Forestry Department and John Tari. The interest is there.

Another collection and project of orchids from the Highlands is to be found just outside Goroka, in the Provincial gardens that have been established by the Rev. Norman Cruttwell. Since Norman will be telling us more about his gardens and the orchids, I will say no more here (see "Orchids of Mount Gahavisuka – Part one: *Bulbophyllum*" *The Orchadian*, volume 9, number 4, pages 79–83; Editor).

Botanic Garden Collections

Over the past few months, I have been able to visit the National Botanic Gardens at Lae, the National Capital Botanic Gardens at the University of Papua New Guinea, and the Orchid Garden at Rabaul. Both Botanic Gardens continue to maintain interesting orchid collections. A new Japanese aid project, the Forest Research Institute, is being erected on the Lae Botanic gardens site and includes extensions to the Botany wing and improvements to the orchid garden. Unfortunately, the activities have left the gardens exposed to thievery and one finds exotic and native orchids being sold on the streets of Lae by small boys. The Rabaul orchid garden is rundown and requires a shot in the arm in terms of tending and spraying for insects. Someone must caretake the area as there are some rather large crocodiles to be looked after in the small zoo on the grounds. This collection contains a representation of the late Kip Mckillop's collection from Arawa, as well as other exotics and native species from New Britain and the Islands. The Lae and Port Moresby gardens are recommended to visitors to these cities.

New Discoveries

To conclude this account of what is happening in this part of the orchid world, I would like to mention a few interesting finds that have been brought to my attention. The first comes from Bougainville where Mr. Barry Middlemiss has found what appears to me to be a form of *D. alexandrae.* As noted by other authorities on the section *Latourea*, this species may be a natural hybrid between *D. spectabile* and *D. macrophyllum.* I hope to cover this in another article.

Finally, word reached me that a new slipper orchid had been discovered somewhere down the Ramu valley, and that the plants were held in the collection once owned by the late Anos Ombas, a protege of Andree Millar. Ten plants were indeed on hand, but the one and only flower had dropped and it was too deteriorated to be of use. The plants had very narrow leaves and reminded me of *P. spicerianum.* Roman, Anos's son, described the flowers as yellow and white, "like a butterfly". We must all wait now until the next flowering to find out what it is. Unfortunately, I understand that some Japanese orchid buyers already know of the plant's existence according to Roman.

Reference

Millar, A. 1978. *Orchids of Papua New Guinea: an introduction.* Australian National University Press, Canberra, pp. 101.

OBITUARY: JAMES T. SIMMONS

Mr. James (Jim) Simmons, a long time member of the Australian Orchid Foundation, passed away on 28th July 1987.

Jim was at one time an Honorary Associate Editor of *The Orchadian* and Chairman of the A.O.F. Publications Committee. He was highly regarded by many botanic gardens around the world who respected his dedication and integrity and was recently honored by Kew Gardens for his services to orchid literature.

Jim was founder member and Past President of the Native Orchid Society of South Australia. He was a devoted worker for the Society from the very early days, serving on the original committee. He was responsible for starting the Society's library, taking on the duties of librarian for a number of years, only relinquishing that post to become President.

During his term of presidency he was instrumental in persuading the A.O.F. to partially fund the purchase of a shade house, now known as the Dr. R.S. Rogers house which was presented to the Adelaide Botanic Gardens to house a collection of Australian terrestrial orchid species to be used by interested botanists in the study of these plants.

It is significant that Jim's first duty in the Society was as librarian as it reveals the true interest he had in orchids, which was not so much as a grower, (although he did at one time have a large collection of Australasian species), but as an historian, very much interested in the early botanists and their writings. He showed a flair for tracking down manuscripts and documents and travelled the world to do so. Having found them, they were often printed in a language other than English requiring translation. Once again Jim's tenacious character came to the fore and he was able to trace and persuade talented people to do the translation. Jim was a great persuader!

It is fair to say that the translation of Schlecter's great work on the Orchids of German New Guinea would not have come to fruition but for Jim's persistance and many hours of hard work, all given quite freely.

I do not wish to imply that Jim Simmons was a dry-as-dust bookworm, anybody who had the privilege of his friendship knows that he was always willing to have a barbie and open a bottle, and above all he will be remembered as a warm and generous human being ready to give advice or practical assistance to fellow orchid enthusiasts. A visitor to his home would rarely leave without some tangible evidence of that visit, be it an orchid seedling, some pots or more likely the loan of one of his precious books.

The orchid world is the poorer place with the passing of Jim Simmons, yet richer for his many contributions.

Reg Shooter
5 Diane Place, Grange, S.A. 5022.

THE GENUS *TROPIDIA* LINDLEY RECORDED FROM AUSTRALIA

D.L. Jones
Australian National Botanic Gardens, P.O. Box 1777, Canberra, ACT, 2601.

C.R. Dunlop
Darwin Herbarium, Conservation Commission of N.T., P.O. Box 496, Palmerston, 5831.

Summary: *Tropidia curculigoides* Lindley is recorded from three localities in the Top End of the Northern Territory. This is the first record of the genus from mainland Australia. Specimens are lodged in the Darwin Herbarium.

Introduction

The genus *Tropidia* Lindley consists of about twenty-two species of terrestrial orchids distributed chiefly in eastern Asia, South-east Asia, and Polynesia with outliers in Florida, Central America, New Guinea, New Caledonia, and Norfolk Island (Koorders 1911, Holttum 1964, Backer and van den Brinck 1968, Luer 1972, Willis 1973, Schlechter 1982).

Australian material of this species was first collected by one of us (C.R.D.) in 1982 while surveying the monsoon rainforest vegetation of the Northern Territory. This material was sterile but a collected plant subsequently flowered in cultivation in January 1985 and was delineated by Bruce Gray. Herbarium material taken by M.A. Clements to Kew in 1985 was identified as *T. curculigoides* Lindley, and subsequently confirmed by C.R. Dunlop while acting as Australian Botanical Liaison Officer at Kew. *T. curculigoides* is known from India and Ceylon (type area), through Indo-china and the Indonesian Archipelago to northern Australia.

Collection Details: (all DNA); Wagait Reserve, 13 08 S, 130 22 E, C.R. Dunlop 6390, 17 Dec. 1983; loc. cit., D.L. Jones 1746 and C.R. Dunlop, 18 Dec. 1984; Black Jungle, 12 33 S, 131 12 E, C.R. Dunlop 6825, 28 Oct. 1986; Melville Island, 11 34 S, 130 33 E, J. Russell-Smith 2531 and D. Lucas, 9 June 1987.

Description
(based on Australian material; Fig. 1)

Rhizome very short, sparingly branched. **Roots** thick, fleshy, unbranched, bearing numerous brown, clavoid, tuber-like swellings ca. 5 mm long on slender stalks ca. 1 cm long. **Stems** 10–21 cm x ca. 0.2 cm, slender, wiry, sparsely branched, basal parts covered with scarious sheathing bracts, swollen at nodes. **Leaves** 3–6 per stem, to 12 cm x 2 cm, ovate to lanceolate, dark green, plicate, with 5 main longitudinal veins, ridged below, margins entire, contracted suddenly into a long, sheathing base. **Inflorescence** a dense terminal raceme 1–2 cm long. **Flowers** ca. 8 mm across, greenish-white, opening widely, borne singly in axils of linear-acuminate bracts 0.5–2 cm long. **Dorsal sepal** 4–5 mm x 2.5–3 mm, narrow-ovate, spreading, margins slightly incurved, apex acute. **Lateral sepals** 4–5 mm x 2.5–3 mm, ovate, conjoined in basal half, gibbous at base, recurved in distal half, apex acute. **Petals** 4–5 mm x 3 mm, ovate, spreading, with a prominent central vein, joined at base to lateral sepals. **Labellum** 5–6 mm x 3.5–4 mm, obovate, saccate, fused in basal half to column, apex shallowly notched, basal spur deeply bilobed, narrowed and recurved near apex and then expanded into a small lobe. **Callus** of 2 raised lobes. **Column** ca. 5 mm long, erect, superficially winged. **Anther-cap** ca. 3.5 mm x 2 mm, ovate with a prominent rostrum. **Stigma** ca. 2 mm x 2 mm, trapezoid, sunken, anterior margin thickened. **Anther-like** projections ca. 2 mm long,

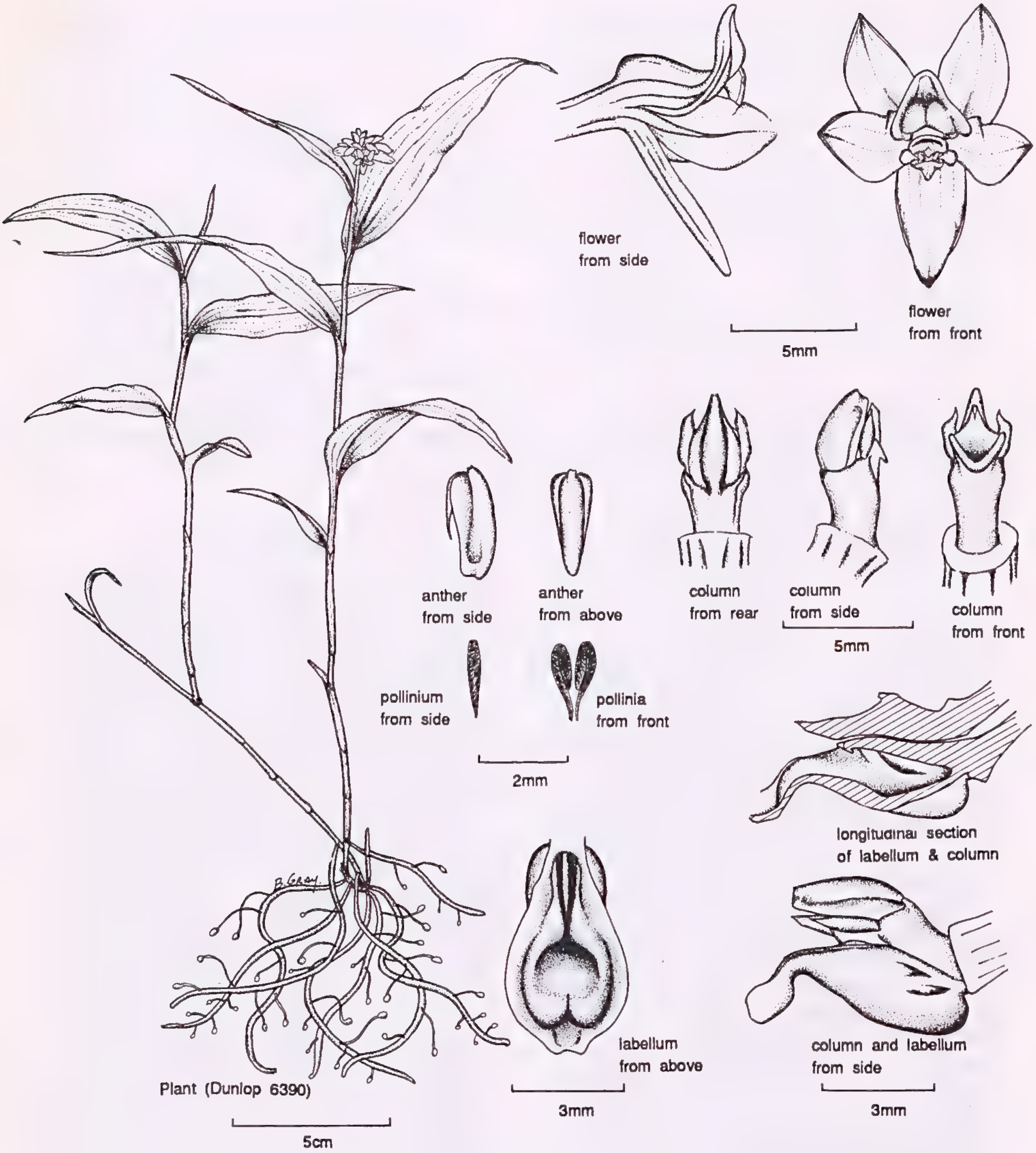


Figure 1. *Tropidia curculigoides* Lindley.

linear-acute, lacking, or 1 or 2 beside anther. **Pollinia** 2, ca. 2 mm x 0.5 mm including stipe, ovate. **Capsule** not seen.

Notes

Habitat: In the Northern Territory, *Tropidia curculigoides* appears to be associated with evergreen monsoon forests, in particular those developed on surface springs or with a source of perennial moisture at depth. Soils range from skeletal on sandstone screes to coastal dunes and sandy loam. In all cases, plants are found growing in deep shade.

Climate: The climate of the area is typical of much of northern Australia. It is seasonally wet from November to March with the early rains emanating from thunderstorms and the later (more substantial) rains from a monsoonal trough. Localized high rainfall may result from cyclones which are sporadic in their distribution. A dry season occurs from April to October and rainfall is generally low or non-existent during this period. Temperature and humidity is lowest in mid winter (June–July) and both peak in November–December with the humidity remaining high throughout the wet season. Bushfires are common in the dry season.

Biology: Very little is known about the biology of *Tropidia curculigoides* in Australia. It appears to remain evergreen throughout the long dry period of the dry season because plants inspected in early December still had mature leaves attached although these were thin and papery. Dry season survival is possibly assisted by the numerous tuber-like swellings which occur on the spreading root system, although these also play a significant role in mycorrhizal symbiosis since each swelling is packed with mycorrhizal fungi (M.A. Clements, pers. comm.). The roots and the tuber-like growths are tough and leathery. Flowering occurs December to January. Little is known of the orchid's pollination except that observations on cultivated plants show that the flowers are definitely not self-pollinating.

Conservation Status: In Australia, this orchid is known only from the three localities listed above, although it is very inconspicuous and will probably be found elsewhere. Plants have a very strong resemblance to juvenile plants of *Flagellaria indica*, a very common climber of tropical regions. Its coded conservation status is 3RC (Leigh, Briggs and Hartley, 1981).

Acknowledgements

The authors wish to thank Mark Clements, Australian National Botanic Gardens, Canberra, and J. J. Wood, Royal Botanic Gardens, Kew, for the identification of material. Jim Armstrong, Australian National Botanic Gardens, provided constructive criticism of the manuscript. We also thank Bruce Gray for the competent line drawing and Barbara Jones for typing.

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Contributions to *The Orchadian* are always welcomed. You do not need to be a professional scientist, a botanist, taxonomist, or ecologist. All that is needed is a desire to communicate your knowledge to your fellow members of The Australasian Native Orchid Society and the readers of *The Orchadian.* Articles from both professional and non-professional people are welcome. The subject can be conservation, culture, observations made on field trips, show results, descriptions of orchids in their native habitat, biographies of prominant orchid people, or any matter dealing with Australasian native orchids.

Send your contributions direct to: ANOS, P.O. Box C106, Clarence Street, SYDNEY, N.S.W. 2000.

setting up a display at Mona Vale Show for many years now and they were placed third this year. All the displays were of a very high standard.

Every year we see several large specimen plants exhibited and this year was no different. Eric Webeck displayed his usual specimen plant, this year it was *D. kingianum* 'Bungan Castle'. Ian Carter displayed two large plants of *D. speciosum* var. *hillii* and R. Phillip also displayed a large specimen plant of *D. speciosum* var. *hillii* but Chris Arnott's plant of *D. speciosum* var. *hillii* made the others look small by comparison. The plant was over 2 m in diameter, approximately 1.5 m high, and carried over 100 racemes of flowers (I stopped counting at 100) and filled up one corner of the hall, a magnificent ball of yellow flowers. The plant needed four men to carry it into the hall but the doors into the hall are only approx. 1.5 m wide. Apart from knocking down a wall, there was no other alternative except to squeeze the plant carefully through the doors. Fortunately, there were no racemes broken but a trail of flowers was left behind much to Chris' anguish. No body would have noticed any missing flowers but I guess it would help if they make the doors wider next year.

On the subject of building alterations, Lou Montuoru and Michael McTiernan would like the ceiling of the hall raised. They exhibited their specimen plant of *D. teretifolium* var. *fairfaxii* which won first prize in Best *Dendrobium* species, terete leaved section and The W. Murdoch Award Bronze Medal. Lou and Mike have been exhibiting this plant for years and it gets larger each year. The plant is over 4 m long, approximately 1 m wide and very florific for a *D. teretifolium* var. *fairfaxii.*

Because of the mild winter experienced in Sydney this year, most growers prior to the show were lamenting that it was an early flowering season, and most of their orchids had already finished flowering. But come showtime, all sections in the show were well represented both in quantity and quality.

Section 1(a), Best *Dendrobium* Species, *Dendrocoryne* Section, attracted 41 entries and was won by Eric Webeck with a plant of *D. kingianum* 'Ruperta'. This plant was smothered with very large flowers of a dark red colour. Lou Montuoru and Michael McTiernan were runners up with a plant of *D. kingianum.* Most of the entries in this section were plants of *D. kingianum*, thus confirming its popularity with native orchid growers.

Dendrobium speciosum
Grower M. Korzenowski
Photo: M. Webb

Another section that is also attracting increased competition is Section 5, Best *Dendrobium speciosum.* Every native orchid grower would like to have a reasonable plant of *D. speciosum* in their collection and the 18 entries in this section were of a high quality. Mick Korzenowski's plant caught the judges eye with David Butler being runner up.

The hybrid sections have always been well represented and the section that attracts me is Section 21, Best Hybrid Seedling–first flowering. This section attracted 18 entries with Sid Batchelor winning first prize with a seedling of *D. kingianum* x *D.* Peach Glow 'Brolga'. This seedling displayed large well filled in peach coloured flowers with excellent substance. With the same plant, Sid won this same section at The Australian Bicentennial Orchid Festival Show held at the Sydney Domain two weeks later. Wal and Jill Upton won second prize with a seedling of *D.* Eureka x *D.* Jamie Upton. This plant had an upright raceme carrying large yellow tetragonum-shaped flowers. Another seedling I consider worth a mention is *D.* Karen Nair, also owned by Wal and Jill Upton. This seedling had large flowers of a deep golden yellow colour and attracted a great deal of attention.

Dendrobium kingianum **'Ruperta'**
Grower E. Webeck
Photo: G. Wells

Dendrobium **Eureka x** ***D.*** **Jamie Upton**
Growers W. & J. Upton
Photo: M. Webb

These colour pictures were made possible by a donation to the colour fund by Mr James A. Walker.

Dendrobium **Karen Nair**
Growers W. & J. Upton
Photo: M. Webb

Dendrobium kingianum **'Ellen' x** ***D.*** **Peach Glow 'Brolga'**
Grower S. Batchelor
Photo: M. Webb

The terrestrial orchid sections are growing in popularity and Section 10, Best *Pterostylis* Species, attracted 12 entries. David McAlpine won both first and second prizes with *P. gibbosa* and *P. boormanii. P. gibbosa* also won The Champion Native Terrestrial Species Orchid and The ANOS Silver Medal.

In summary, congratulations are due to the show committee which comprises Bob Lowe, Chris Arnott, Norm Hilliger, and Lou Montuoru for a job well done. Thanks also to all the members who assisted with the set-up and manning of the show over the 2 days. Whilst the show is staged by ANOS Warringah Group, the contributions of ANOS Wollongong Group and ANOS Sydney Groups was greatly appreciated. I hope to see you all at Mona Vale in 1989.

Jim Bailey

WOLLONGONG AND DISTRICT NATIVE ORCHID SOCIETY SPRING SHOW

The Wollongong and District Native Orchid Society held their Spring Show at Westfield Shopping Town from the 6th to the 8th of October, about two weeks later than our usual show dates. It was first thought that the show would not be as large as previous shows or that the plants would have finished flowering before the show date. In some sections, this was the case, but certainly not in others. Although most sections were well displayed, it was the *Sarcochilus* and their hybrids that caught the eyes of everyone. The *Sarcochilus hartmannii* section took up a metre of bench space, with one plant alone, with countless racemes covering half a metre. This magnificent plant was only just beaten for Best Cultured Orchid by a *Dendrobium ruppianum* with so many racemes that it looked like a snow storm gone slightly yellow.

With seven trophies up for grabs, competition was fierce. As stated before, *D. ruppianum* owned by Ron Wheeldon took out the Best Cultured Orchid. The Peter Gough Memorial Trophy for Best *Sarcochilus falcatus* was won by Marj and Bill Crawford with a beautifully flowered specimen with large flowers of such good shape and texture that the prize was beyond the reach of anyone else.

The Ken Russell Perpetual Trophy for Best *Dendrobium* Species Seedling – First Flowering, was won by Marj and Bill Crawford with a neat *D. kingianum* var. *silcockii* which had flowers of good size and shape with clear colours. Champion Native Species Orchid was won by Ron Wheeldon with his plant of *D. trilamellatum* which had large

Dendrobium trilamellatum
Grower R. Wheeldon
Photo: R. Lea

showy flowers that caught the eye. Champion Australasian Species or Hybrid was also won by Ron Wheeldon. The plant was *D.* New Guinea, a hybrid between the Papua New Guinea species *D. atroviolaceum* and *D. macrophyllum.* It was covered with white flowers with brownish/purple striations and spotting and a deep purple lip. The flowers faced outwards and not downwards like so many other hybrids of the *Latourea* section.

Grand Champion of the Show and Champion Native Hybrid was won by Ron Wheeldon with a *Sarcochilus* Melba. The plant had several racemes with very large, good shaped flowers. No matter where one stood, the lights from the Shopping Centre made the flowers glisten. This plant was also nominated for the Ira Butler award.

It would take too long to describe all the show winners, but suffice to say that with the pinks and reds of the genus *Dendrobium* and the contrasting whites of the genus *Sarcochilus*, the Wollongong and District Native Orchid Society Spring Show was a most successful and, indeed, a very beautiful one.

Russell Lea

AUSTRALIAN NATIVE ORCHID HYBRIDS

(New registrations by the R.H.S. from lists in the Orchid Review, October — December, 1988.)

NAME	PARENTAGE	REGISTERED BY
Dendrobium		
Bill Lonne[1]	*dicuphum* x *agrostophyllum*	Lonne's
Brolga[2]	Peewee x Hilda Poxon	W. Upton
Cockatoo[3]	Peewee x Colin	W. Upton
Gaye Starr	Star Imp x Peter Hewitt	R. & D. Sheen
Harbour Flare	Bold Lip x *canaliculatum*	G. Long (D'Bush Orchs.)
Ira's Star	Andrew Persson x *tetragonum*	S. Batchelor (I. Butler)
Jeffrey Lonne[4]	*bifalce* x *dicuphum*	Lonne's
Kunia[5]	*affine* x *dicuphum*	M. Miyamoto's
Margie Gem[6]	*dicuphum* x *bairdianum*	J. Mewburn
Ranger	Kim Heinze x *falcorostrum*	R. & D. Sheen
Regal Affair	Ku-Ring-Gai x Star Imp	R. & D. Sheen
Yondi Dreamtime	Yondi x *tetragonum*	S. Batchelor
Yondi Star	Ellen x Ira's Star	S. Batchelor

The registrations indicated by the superscripted numerals will be listed under the following names in *A Checklist of Australian Native Orchids* published by ANOS:

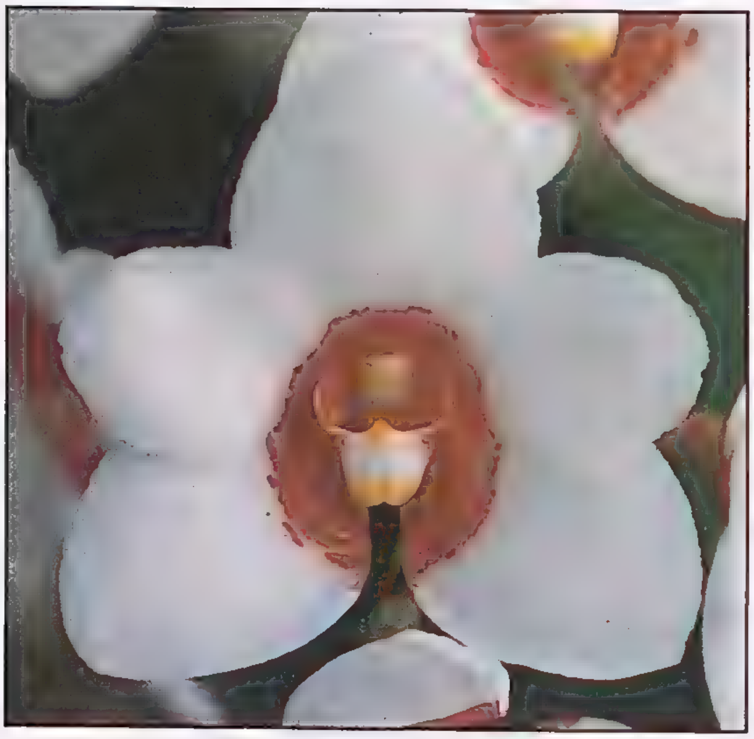
NAME	PARENTAGE	REGISTERED BY
Dendrobium		
1. Bill Lonne	*affine* x *agrostophyllum*	Lonne's
2. Brolga	Suzanne x Hilda Poxon	W. Upton
3. Cockatoo	Suzanne x Colin	W. Upton
4. Jeffrey Lonne	*bifalce* x *affine*	Lonne's
5. Kunia is a sibling cross between forms of *D. affine*		
6. Margie Gem	*affine* x *bairdianum*	J. Mewburn

ANOS NEWCASTLE GROUP

Spring *Sarcanthinae* Show

Setting off for a three week holiday up north, my wife Allison and I decided to call in at the Newcastle ANOS Group Spring *Sarcanthinae* Show, held on the weekend of the 8th and 9th of October, 1988.

First impressions upon entering the shed where the show was being held were of the incredible perfume that only our native orchids possess and splashes of intense colour from the Bromeliads that festooned the area surrounding the show benches. After scaling the baracade for a closer look (with the permission of the Show Marshall) I was treated to some of the best cultivated examples of the genus *Sarcochilus* that I have been privileged to see.



***Sarcochilus hartmannii* 'Red Circle'**

The first plant to spring to my attention was a superb clone of *Sarcochilus hartmannii* 'Red Circle' exhibited by Ken Russell. The northern form of this species is renowned for intense red markings surrounding the centre of the flower. This clone, along with another of Ken's (*S. hartmannii* 'Red Snow') would have to be two of the best plants of this form currently in cultivation.

The flowers are large and the segments overlap giving a very pleasing effect. Add to this the brilliant markings and the good displaying nature of this plant and you have a show winner; the judges thought so and they awarded it the Champion Species of the show, even though Ken found an interesting use for talcum powder with regard to *botrytis* spoting.

Alongside *S. hartmannii* 'Red Circle' was *S. hartmannii* 'Eric Marygold #1', another of Ken's plants. This one carried three spikes on a robust plant with most flowers looking in the same direction, something that can be lacking in some otherwise good clones of this species.

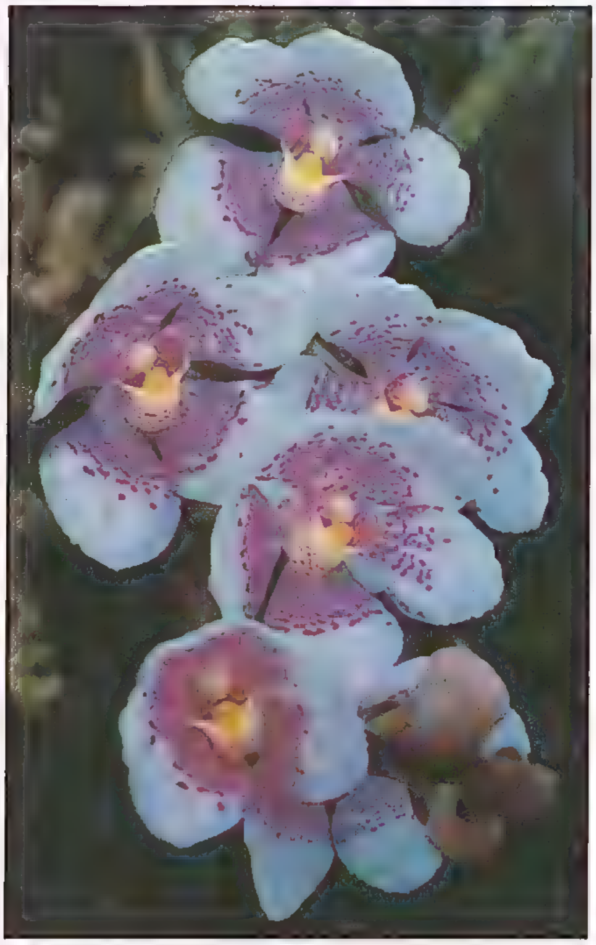
Displayed near these large specimens was an interesting new, as yet unnamed hybrid by Neil Finch, *S. australis* x *Plectorhiza tridentata* (You will have seen another newly registered hybrid using *P. tridentata* in the last issue of *The Orchadian, Plectochilus Kilgra*). This plant, like *Plectochilus* Kilgra, was flowering from a very small single growth. The two flowers were brightly coloured and prominently marked, particularly on the side lobes of the labellum. This will certainly be one of those hybrids that improves with a few years growing under its belt, definitely something for those members like myself who are fascinated by some of the smaller, but definitely no less beautiful hybrids within the subtribe, *Sarcanthinae.*

Another interesting hybrid benched by Neil was *Sarcochilus* Canary x *Rhinochilus* Dorothy. This plant was displaying a long, pendulous spike carrying fifteen creamy yellow, starry flowers. This hybrid showed the potential that crosses with *R.* Dorothy are capable of, large numbers of well spaced, heavily marked flowers.

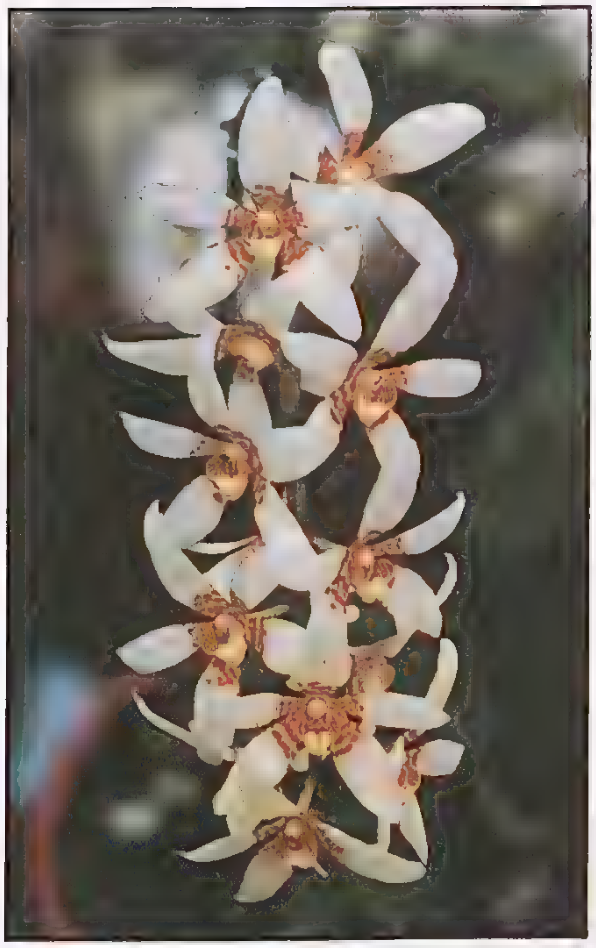
The next plant I saw in this section was *Sarcochilus* Elizabeth by Ken Russell, a beautiful example of this hybrid with six flowers that were well filled in and heavily spotted in purplely-pink against a crystalline white background.

Another unnamed hybrid, *S.* Melba x *S.* Fitzhart by Neil Finch was of similar colouring to the *S.* Elizabeth except that the blotches of colour were larger and more centrally concentrated within each flower.

Centrally located on the main bench of the display was a very interesting new, unnamed *Sarconopsis* hybrid, *Sarcochilus* Melba x *Phalaenopsis amablis* exhibited by Ken Russell. One thing you have to say for Ken is that he really knows how to grow and flower *Sarcanthinae* species and



***Sarcochilus* Elizabeth**



***Sarcochilus* Canary x *Rhinochilus* Dorothy**

hybrids to perfection. This *Sarconopsis* differed from *S.* Lavinia in that the flowers were more circular and the labellum was bright yellow. Also, the petals and sepals had the faintest touch of pink towards the centre of each flower. Unfortunately at the time of judging early on the Saturday morning this plant only had two flowers open. On the Sunday morning when we saw it five flowers were open to perfection, a beautiful sight indeed.

Hanging above the *Sarconopsis* was a large mass of white flowers belonging to a lovely specimen (or should that be speciperson?) of *Dendrobium ruppianum* var. *magnificum*, a pleasant sight indeed.

Another superb plant which was judged Champion Australian Native Hybrid was *Dendrobium* Gloucester Sands 'Kirra-lea' by Greg Field. This plant had one spike open of well shaped, beautifully coloured and evenly spaced flowers. First in the *Dendrobium kingianum* section was a first flowered seedling *D. kingianum* 'Pink Salmon' x ('Lipstick' x Self) by Neil Finch. This plant had very appealing upright spikes of large pink, well opened flowers.

In the first-flowering seedling section a brilliant red flowered plant labelled as *Sarcochilus* Southern Cross caught the eye immediately. The shape and colour of this flower reminded me of a plant of *Sarcochilus* Mavis x *S. australis* exhibited by Daryl Smedley at the Sydney ANOS Group Show a few weeks earlier. The colour of this particular plant was unusual for *S.* Southern Cross, which are usually yellow to cream in colour.

Unfortunately we had another appointment further north that afternoon so further photos and admiring were not possible.

I definitely would recommend this show as a chance to see some of the best *Sarcanthinae* species and hybrids grown on the Eastern Coast of Australia. Special mention should be made of the work by Neil Finch and Tony Clark in staging and marshalling this show. Well done Newcastle ANOS Group for a very impressive first Spring *Sarcanthinae* Show. We will certainly be looking forward to future shows.

Mark Webb

REPORT FROM THE IRA BUTLER TROPHY COMMITTEE, 1988

This year, 18 entries were received from 12 Orchid Societies or ANOS Groups. The standard of entries continues to improve, making the final decision for the overall winner very difficult. As the judging has to be done from photographic slides, it is important that these be good and do justice to the flower and plant as a whole. The entries were –

- Queensland Orchid Society
  - HCC Award – N.J. Grundon — *Dendrobium* Hilda Poxon 'Winifred Mary' HCC/AOC/QOS
- ANOS Warringah
  - Spring Show – W. & J. Upton — *Dendrobium* Elegant Heart 'Warringah'
- Wollongong and District Native Orchid Society
  - Spring Show – R. Wheeldon — *Sarcochilus* Melba
- Far North Coast ANOS
  - Spring Show – M.J. Symmons — *Dendrobium* Our Native
  - Bicentennial Orchid Workshop – A. Peck — *Dendrobium* Elegant Heart
- Orchid Club of South Australia
  - Autumn Show – L. & R. Moore — *Dendrobium* Hilda Poxon 'Crozier'
  - Winter Show – I. & C. Tucker — *Dendrobium* Johulatum
  - Spring Show – L.T. & M.K. Nesbitt — *Pterostylis* Hoodwink
- ANOS Central Coast
  - Spring Show – R. & S. Barrett — *Dendrobium* x *delicatum*
- Tasmanian Orchid Society
  - Spring Show – J.F. Smith — *Dendrobium* Bardo Rose 'Bronilyn'
- Orchid Society of Western Australia
  - Winter Show – J. & D. Flemming — *Dendrobium* Hilda Poxon
  - Spring Show – G. & A. Hansen — *Dendrobium* x *delicatum*
- Orchid Society of NSW
  - Winter Show – S. Batchelor — *Dendrobium* Aussie Child 'Yondi'
  - Spring Show – W. & J. Upton — *Dendrobium* Elegant Heart 'Warringah'
- Native Orchid Society of South Australia
  - Spring Show – B. Mules — *Dendrobium* Aussie Utmost
- ANOS Newcastle Group
  - Spring Show – G. Field — *Dendrobium* Gloucester Sands 'Kirra-lea'
- ANOS Sydney Group
  - Autumn Show – P. Eygelshoven — *Pterostylis* x *toveyana*
  - Spring Show – W. & J. Upton — *Dendrobium* Elegant Heart 'Warringah'

Champion Australian Native Orchid Hybrids of 1988

Dendrobium Hilda Poxon 'Winifred Mary' HCC/AOC/QOS – owned by N.J. Grundon

Dendrobium Elegant Heart 'Warringah' – owned by W. & J. Upton

Dendrobium Hilda Poxon 'Winifred Mary' was a magnificent example of a developed hybrid style on a very well-grown plant with a great display of flowers, while with *Dendrobium* Elegant Heart 'Warringah', W. & J. Upton have achieved a breakthrough in breeding which should lead to some new and exciting hybrids in the future. It was decided that they be equal Champions.

Congratulations to all associated Groups and Societies. There really were some great hybrids entered this year. Once again, thank you for your participation in our efforts to encourage the development of new and better hybrids of our native orchids.

Ruth Rudkin, Hon. Secretary, on behalf of the Committee

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- **Native Orchid Society of Toowoomba Inc.**, Hon. Secretary, P.O. Box 5141, Toowoomba QLD 4350. Tel: (076) 35 8627. Meets 7.30 pm on the 1st Friday of each month at the Technical & Further Education Centre, Old Empire Theatre, Neil St., Toowoomba.

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- **ANOS Port Hacking Group**, Hon. Secretary, P.O. Box 359, Gymea NSW 2227. Tel: (02) 524 9996. Meets 8 pm on the 4th Wednesday of each month at the Community Hall, Gymea Bay Rd., Gymea.
- **Wollongong & District Native Orchid Society Inc.**, Hon. Secretary, 13 Eleanor Ave., Oak Flats NSW 2529. Tel: (042) 56 1608. Meets 7 pm on the 2nd Tuesday of each month at the Wollongong High School, Common Room, Lysaght St. Fairy Meadow.

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- **ANOS Victorian Group**, Hon. Secretary, P.O. Box 285, Cheltenham VIC 3192. Tel: (03) 583 4278. Meets 8 pm on the 1st Friday of each month at the West Hawthorn Uniting Church Hall, Power Rd., Hawthorn.
- **ANOS Geelong Group Inc.**, Hon. Secretary, Lot 2, Newcombe St., Drysdale VIC 3222. Tel: (052) 51 3186. Meets on the 2nd Wednesday of each month at the Fidelity Hall, Star St., Geelong.

SOUTH AUSTRALIA

- **Native Orchid Society of South Australia Inc.**, (Associated Society) Hon. Secretary, P.O. Box 565, Unley SA 5061. Tel: (08) 272 9245. Meets on the 4th Tuesday of each month at St. Matthews Hall, 67 Bridge St., Kensington.

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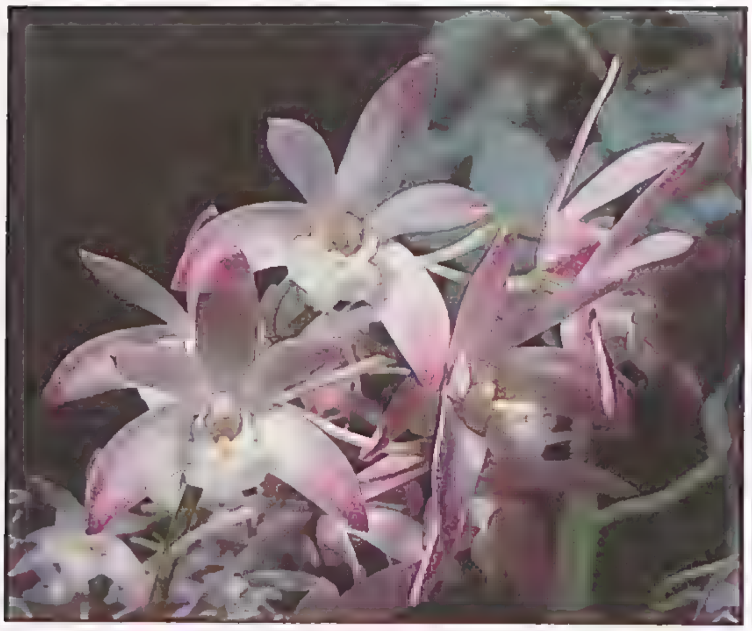
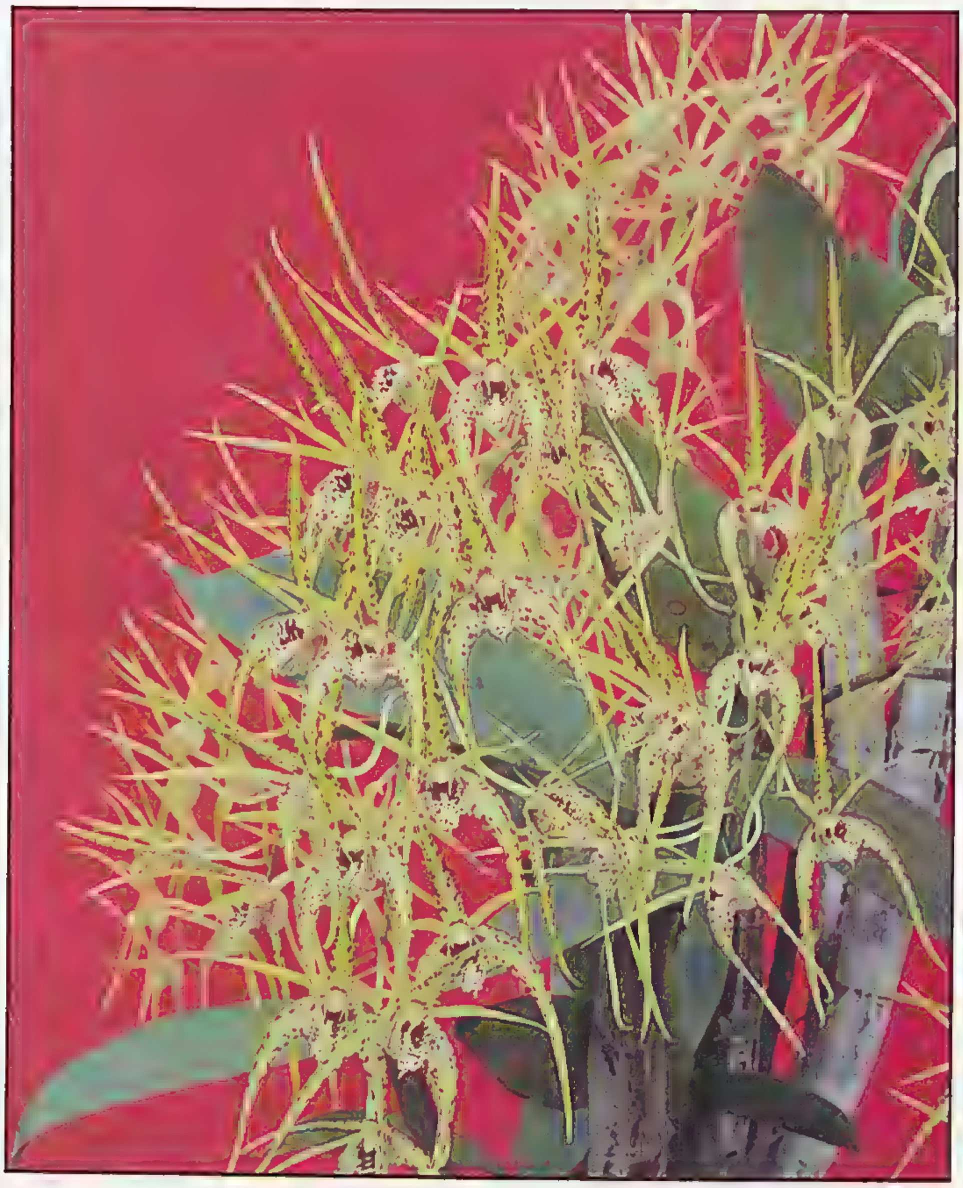
- **Western Australian Native Orchid Study and Conservation Group (Inc.)**, (Associated Society) Hon. Secretary, P.O. Box 323, Victoria Park WA 6100. Tel: (09) 378 1278. Meets on the 3rd Wednesday of each month at the Kings Park Board Administration Centre Theatrette, Kings Park, West Perth.

NEW ZEALAND

- **New Zealand Native Orchid Group**, (Associated Society) Convenor, 45 Cargill St., Dunedin, New Zealand.



Dendrobium **Bardo Rose 'Bronilyn'**
Grower J.F. Smith
(See Page 138)



Dendrobium **Hilda Poxon 'Winifred Mary' HCC/AOC/QOS**
Grower N.J. Grundon
(See Page 138)

Photos courtesy of the Ira Butler Trophy Committee.

These colour pictures were made possible by a donation to the colour fund by Mr James A. Walker.

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Dendrobium smillieae F. Muell.

THE ORCHADIAN *VOLUME 9, No. 7*

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Date distributed: JUNE 4th, 1989

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EDITORIAL

In *Readers' Forum*, I have included a letter from Chris Gammage in which he issues a challenge to ANOS Groups and growers of native orchids to do something about helping those people who wish to grow native orchids. He has made many constructive comments: supply beginners with a flowering-size plant rather than a seedling; improved publicity of meetings of ANOS groups; provide readily available information on culture of native orchids, including regular articles in local papers; and some ideas on talks to be given at meetings.

Did I hear somebody say, "So what's new? We have heard it all before!" Yes, you are right — we have heard it all before. And for just that reason, I wish to add some of my own thoughts to what Chris has said.

Firstly, have we became complacent by years of familiarity with our hobby and let the flame of our initial enthusiasm burn low? As Chris said, "Can you remember what it is like to be a beginner? ... ". Are we as efficient in promoting our hobby now as we were when we first started? The fact that there are still people who are having difficulty finding out about ANOS and its Groups, people who are having difficulty finding information about how to grow native orchids, people who are not getting the full satisfaction from their hobby, indicates to me that there are some matters to which we should give attention.

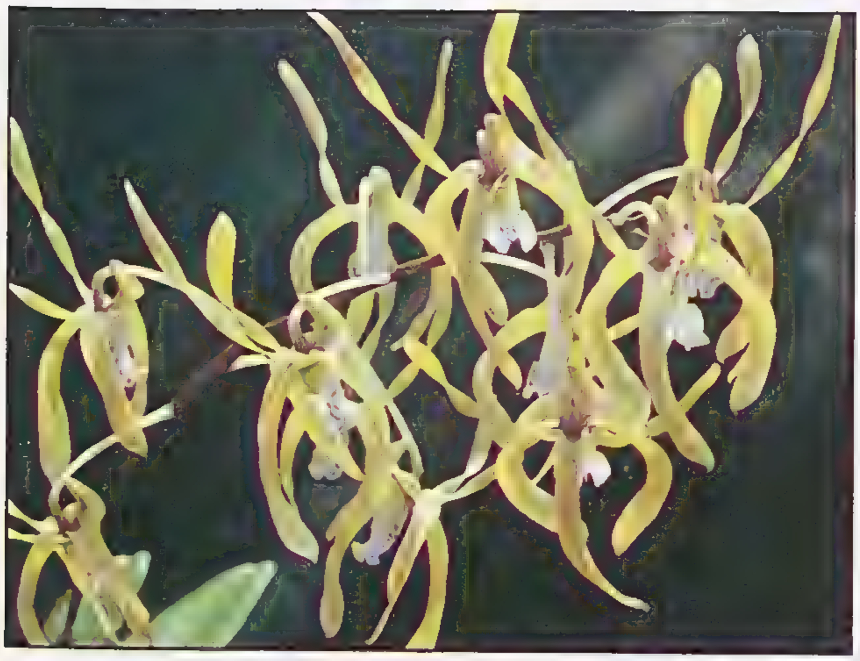
One of the first facts we should recognise is that many of the people who wish to grow native orchids may never wish to join an orchid society. But we who claim to be native orchid devotees have a responsibility to see that all growers of native orchids know the importance of conservation of these plants, know where good quality, seed-raised plants can be obtained, and know how to survive and grow them. We can reach our club members through *The Orchadian* and our local club Newsletters, but regular articles in local papers are what is needed if we are to reach those people in the general community who grow native orchids. Perhaps the Editors of local club Newsletters could give some thought to submitting articles from their Newsletter for publication in the gardening pages of the local newspaper.

Are we doing enough to publicise the activities of ANOS and its Groups? Does every native orchid devotee know of *The Orchadian*? Are we making maximum use of the free community services offered by local radio stations and newspapers to publicise the activities of local clubs. I know of the big efforts being made by ANOS Council to improve its own publicity; placing advertisements in gardening magazines, offering subscriptions to *The Orchadian* as prizes in raffles run by local Groups, sending *ANOS News* to all Groups. But the real bulk of the membership of native orchid devotees is with the ANOS Groups and affiliated societies. Are these clubs doing all they could to publicise their hobby at the local level? This question might be discussed at the Management Committee meetings of the local Groups. Have you publicised the activities of ANOS Council to your members? Have you included in your Newsletter, the information supplied by your ANOS Liaison Officer and the information provided in the *ANOS News*?

What special efforts are being made by the local Groups to educate their new members in the growth and presentation of native orchids? I know of clubs where, before every second meeting or on certain weekends, a special meeting is held where experienced growers discuss a topic suggested by the beginners. It is truly amazing how long many people consider themselves to be beginners just to be able to attend these special meetings. Chris has offered a number of other ideas which warrant consideration: special talks on judging, adoption of a beginner by an experienced grower (what a good way of fostering friendship within the club), and more novice classes at shows.

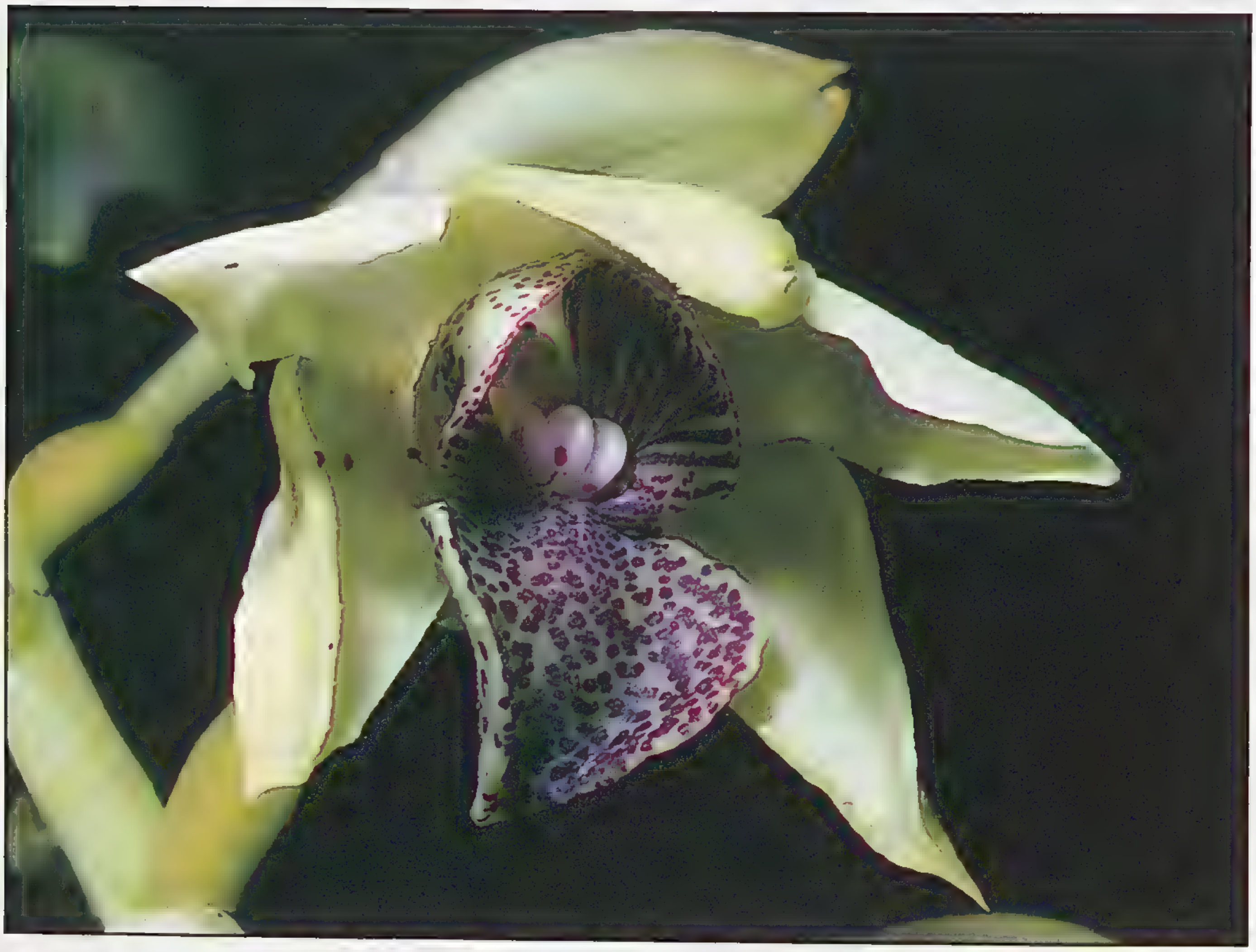
Well, I may have rambled on a bit. And I suspect that the reason is that looking after the beginner, the new member, is a subject close to my heart. Can you remember what it was like to be a beginner? Think back – what wind of change would you like to see blow through your local club? Will you be the one to open the door and let the gentle breeze begin?

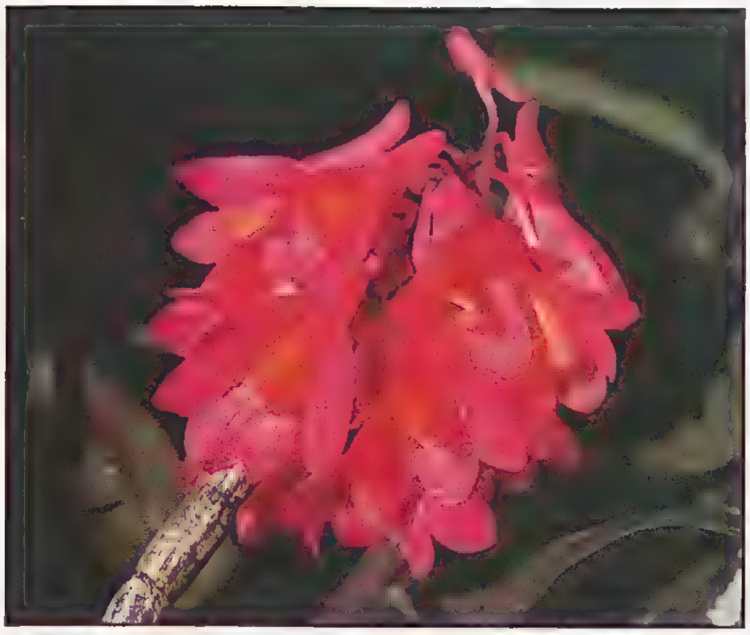
Noel J. Grundon



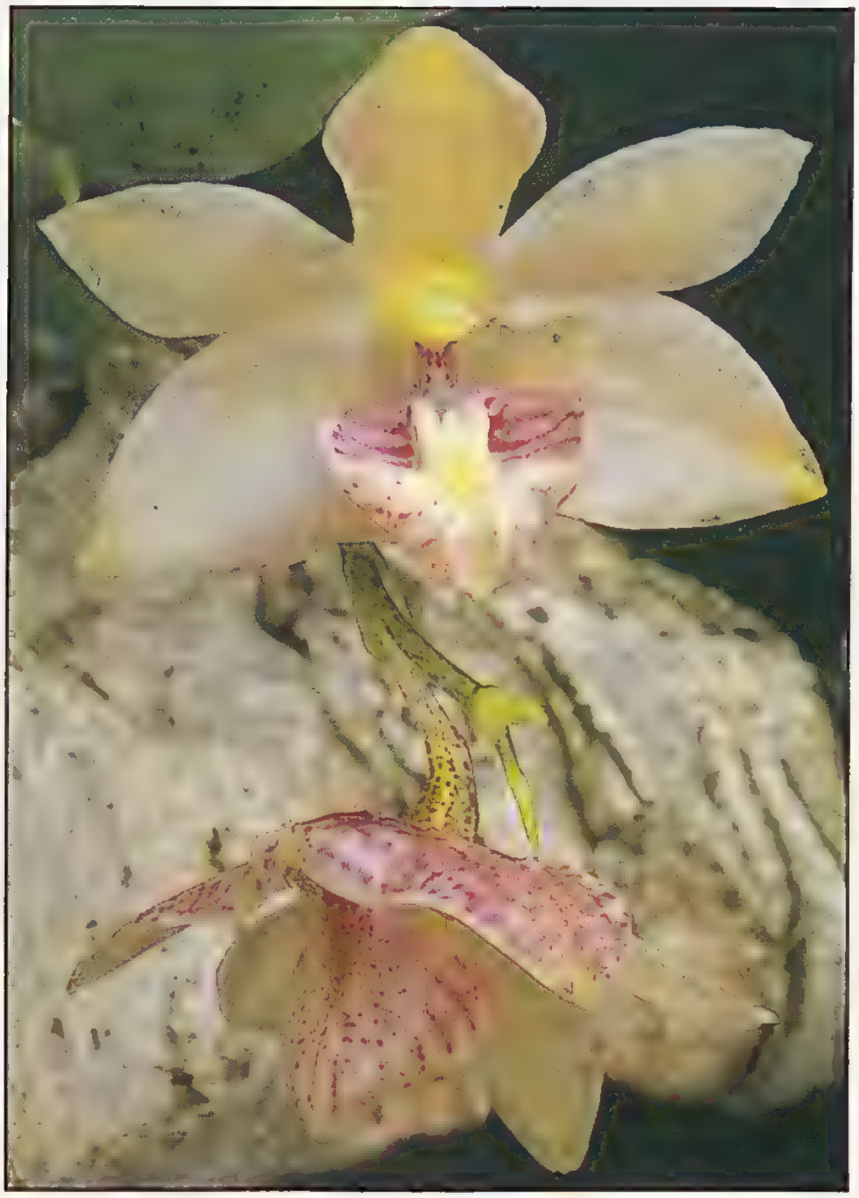
Dendrobium hamiferum Cribb
The type collection discovered by Tom Reeve at 1800m in 1980 at Yondalia, Enga Province. Photo by T. Reeve (See page 146).

Dendrobium Engae T.M. Reeve
The offical emblem of Enga Province, Papua New Guinea. Photo courtesy of Mrs A. Millar (See page 146).





Dendrobium pseudoglomeratum T.M. Reeve & J.J. Wood
A common species from the Eastern Highlands of PNG. Photo by N. Cruttwell. (See Page 147)



Dendrobium cruttwellii T.M. Reeve
A beautiful species named in 1983 by Tom Reeve in honour of Canon Norman E.G. Cruttwell, the author of this article. Photo by W.T. Upton.
(See Page 147)

ORCHIDS OF MOUNT GAHAVISUKA - PART TWO: *DENDROBIUM*

Norman E.G. Cruttwell
'Calanthe', P.O. Box 961, Goroka, E.H.P., Papua New Guinea.

'Living on Trees' – this is what the name *Dendrobium* means. It corresponds to the American genus *Epidendrum* which has the same meaning and, indeed, occupies the same ecological niche. *Dendrobium* is the best known of all the orchid genera in the eastern hemisphere, containing most of the ornamental and popularly cultivated orchids. It has been extensively hybridised and dendrobiums exist of every colour in the rainbow and a few more. In Papua New Guinea, it contains most of the ornamental species which can compare favourably with any others in the world. Although *Bulbophyllum* is undoubtedly the largest genus, it is less well known and contains far fewer ornamental species. We grow most of the true highland dendrobiums in the Lipizauga Botanical Sanctuary within the Mount Gahavisuka Provincial Park which was described in my first article on *Bulbophyllum* (Cruttwell 1988).

The 'Ceratobiums'

On the whole, the genus is more prominent in the lowlands and foothills where the dominant group is the large section *Spatulata* (formerly called *Ceratobium*) with their twisted petals and abundant many-coloured flowers. There are very few of this section in the highlands. One species, however, is common in the highlands, namely *D. crispilinguum* which has rather slender greenish-white flowers with very twisted petals and a crinkly labellum of violet purple. It is quite attractive in a delicate way, producing long canes often with many inflorescences. There are two other related species, *D. magistratus* and *D. hamiferum*, both discovered by Tom Reeve in the Enga and Southern Highlands Provinces. I have one plant of the former in the Sanctuary but it has not flowered. It grows at about 1300 m, a bit low for us at 2000 m plus.

The Latourias

The section *Latouria* (usually written *Latourea*) contains some of the most beautiful and showy species in Papua New Guinea. The famous *D. johnsoniae* is not strictly 'highland', occurring in the foothills from about 300 m to 1000 m. We cannot grow it in our Park but it flourishes at Goroka (1500 m). *D. johnsoniae* is typical of this section having elongated pseudobulbs which are variously swollen and carry a few terminal leaves which may be lost on older pseudobulbs. The flowering racemes arise in the axils of the leaves or the nodes from where leaves have been shed. The flowers may be few or many but are usually large and showy. They are a superb group of orchids and to see them growing high up on an exposed branch with their flowers shining in the sun is a truly rewarding experience.

I will start the highland latourias with a group which have stiff hairs on the back of the sepals and ovary, although the petals are always glabrous. The most hairy of these is the rather sombre *D. finisterrae* which is fairly common throughout the highlands. The flowers are very large but do not open widely and are greenish white in colour with purple blotches and dark lines on the labellum. Rather similar, but much more attractive, is *D. polysema*. The flowers are extremely numerous, open wider and are lighter in colour, though still abundantly spotted. A large plant with many sprays is a conspicuous object. In the same group is *D. forbesii* which grows at lower altitudes (about 1000 m to 1300 m). At first, the flowers are pure white in colour but later change to cream. *D. forbesii* is a profuse flowerer and a large clump of it on a tree is a beautiful sight.

Rather similar in structure but without the hairy back is the magnificent *D. engae*, the official emblem of the Enga Province and depicted on its flag. The large wide-opening flowers are pure white in colour, although the sepals eventually go yellow. The labellum is densely black-spotted below and red-lined on the lobes. On mature plants, the flowers are produced in great profusion and are sweet-scented. *D. engae* grows high on Southern Beech trees (*Nothofagus*) at high altitudes mainly in the Enga Province and is greatly sought after by collectors. It has been placed on the protected list and can not be exported. *D. engae* is perhaps the finest of the highland orchids. It is a great pity that there is no serious propagation of P.N.G. orchids and that they are still being torn out of the bush for illegal export.

Another magnificent *Latouria* which comes from rather lower altitudes is *D. rhodostictum.* This species is allied to *D. johnsoniae,* with much the same colour scheme but distinguished by its very long obrhomboid petals which far exceed the sepals in size. The flowers are pure white in colour with the labellum streaked with violet. There are several distinct forms of *D. rhodostictum,* the Bougainville one having an egg-shaped swelling right at the top of the pseudobulb, whereas the Daga form has long fusiform pseudobulbs. There is a famous plant from Bougainville called 'Kip's Special' which has more rounded petals and more violet flecking, and I think it may be a form of this species. Unfortunately my only plant was stolen. In Bougainville too is the rarer and similar *D. ruginosum,* but I have not personally seen it. Similar to *D. rhodostictum* but much smaller is *D. otaguroanum* (*D. chloroleucum* of Schlechter) which replaces *D. rhodostictum* at higher altitudes.

D. kauldorumii is another nice latouria, almost confined to the Simbu Province. The fattish pseudobulbs are purple and the flowers rather small but numerous, delicate, and white in colour with a green veined lip. Another *Dendrobium* common in the Park is *D. mayandyi* which has a pendulous habit and small fleshy green flowers with purple spots. However, the flowers often turn to a bright salmon pink as they age. I found a similar species on Bouganville which had larger white flowers with a green base. I have not yet identified it. Another rare pendulous species is *D. geotropum,* found by Tom Reeve, the former curator of the Highland Orchid collection at Laiagam, in the *Nothofagus* forests of Mt. Giluwe (Reeve 1983c). Unfortunately, I have been unable to discover it. *D. geotropum* is pendulous and has rather large apple green flowers with chocolate-purple labellum and a white callus. It is a very handsome plant.

In this group, with erect pseudobulbs but pendulous inflorescence, is *D. cruttwellii* which was described and illustrated by Reeve (1983a). I first found this species in the Daga (Milne Bay Province), and later on Mt. Kaindi near Wau, and in several highland localities, including our Park. It is widespread but never common, and is confined to a very limited altitude, about 2000 m. The rather delicate pendulous flowers are greenish white in colour with purple dots and an apple green labellum. It grows on tree trunks, never more than 3 m from the ground. Very convenient.

Now I come to two superb species which are closely allied. The first is *D. terrestre,* often, but by no means always, terrestrial. It occupies a niche at around 1500 m to 2500 m, above which it is replaced by its cousin *D. rigidifolium.* The flowers of *D. terrestre* start cream with purple speckling, but as they age, turn a beautiful apricot-orange colour. Schlechter was so impressed that he named it *D. magnificum.* Superior forms occur on Mt. Kaindi. *D. rigidifolium* which is hard to distinguish from *D. terrestre* when not in flower, is a plant of the upper montane forest on *Nothofagus* trunks. The similar flowers are white in colour with a slight purple flushing, but fade to a delicate rose pink colour.

To complete this marvelous section, I must mention some of the smaller species which are not so showy but still well worthy of cultivation. My favourite is *D. aberrans,* an uncomplimentary name for a delightful orchid. It is a typical *Latouria* in shape but is only a few centimetres high. The pseudobulbs are spherical in shape at the top and carry two or three ovate leaves and dense sprays of small white flowers with a pinkish flush, the labellum being deeply incised. It grows in colonies on shady tree trunks. Closely allied and growing in a similar habitat is *D. woodsii* (named after Patrick Woods, a fine orchid botanist at Edinburgh) which is somewhat taller and more slender, the labellum being four-lobed and purple in colour. I have only seen these in the Milne Bay Province. Here in the highlands we have the small pendulous *D. armeniacum* which has flowers with white or pale green sepals and a bright orange lip with red lines. The smallest of all the latourias is *D. simplex* which has a creeping habit and comes from the high forests. *D. simplex* bears a single greenish white flower per pseudobulb.

Section *Pedilonum*

This section is typified by the well-known lowland species *D. smillieae,* attractive enough but nothing to shout about. *D. purpureum* (formerly *D. capituliflorum,* a much more apt name) gets into the lower highlands. However, the much more showy *D. pseudoglomeratum* is common in the Eastern Highlands. Its cane-like pseudobulbs, both

(continued on page 160)

DIURIS VENOSA: AN ORCHID IN DANGER

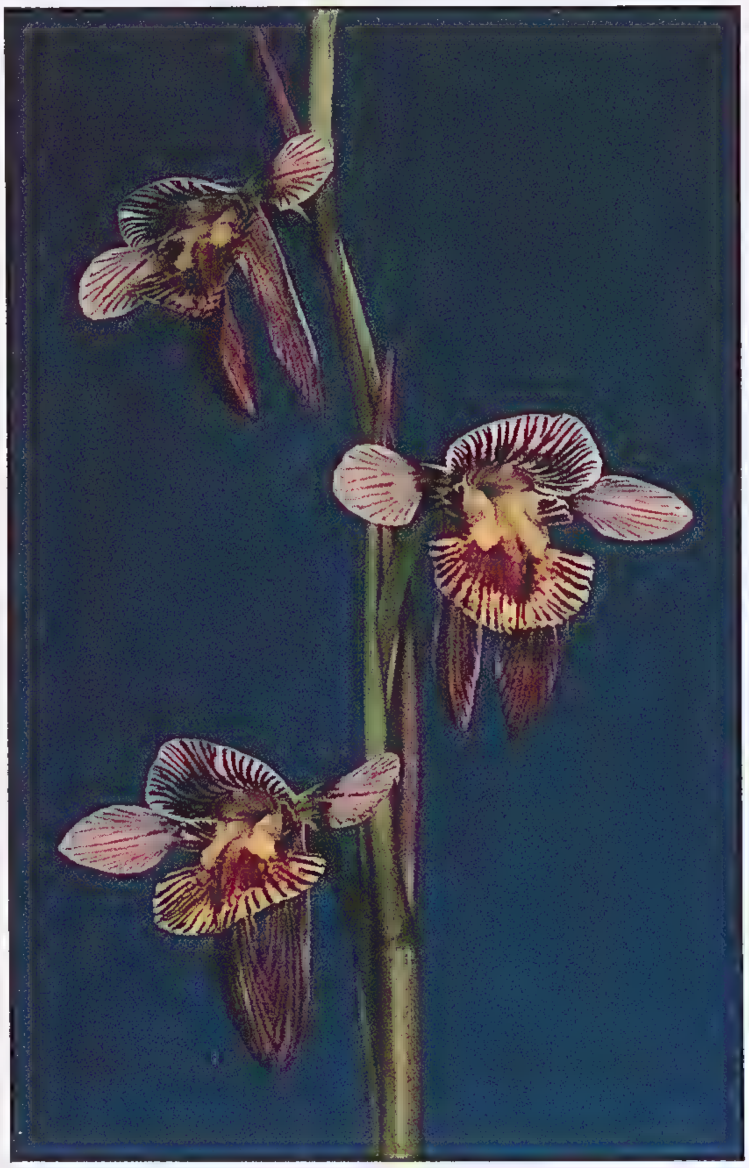
R. Bates
38 Portmannock Street, Fairview Park, S.A.

Diuris venosa **Rupp, the 'Veined Doubletail', is a uniquely beautiful Australian terrestrial orchid. The purple-veined flowers are most distinctive and make it highly sought after. It was long thought to be confined to the 1600 m basalt capped plateau known as the Barrington Tops in NSW. This 30 km wide area of open woodland, ice-cold streams, grassy frost-hollows and swamps is such a restricted area that this alone would tend to place the orchid in danger, especially when one considers that *D. venosa* grows only in rich loams in grassy open places near swamps. Fortunately most of the Barrington Tops is now a National Park. Isolated populations of *D. venosa* are now known to occur hundreds of kilometers away on the New England plateau. However, these populations are largely on roadsides and are very much under threat.**

Leigh, Briggs and Hartley (1981) noted that *D. venosa* was rare and restricted and gave it a 2RC rating. This must now be altered to 3RC. It was recently suggested to me that the main threat to *D. venosa* is the orchid collector. This is obviously not so as the largest and densest population of the species is adjacent to the car park of a favourite picnic spot. As it has long been the best known population of the species and must be subjected to both flower picking and tuber collection, one would have expected some deterioration of this colony – yet the reverse is true. It is the human presence at this site that keeps it open and makes it an ideal habitat for the orchid.

The real threat to *Diuris venosa* comes not from people but from the two worst introductions to the area; one an animal, the feral pig *Sus scrofa*; the second a plant, common broom *Cytisus scoparius*.

Approximately 10 per cent of the orchids' habitat is rooted each year by the pigs; given a population of some 50 000 individual *D. venosa* plants, this means that 5 000 may be destroyed by the animals each year. Fortunately, *D. venosa* seeds freely and it is likely that, given time, plants would recolonise the rooted areas. The pigs are intimidated by human presence and this is one reason why the 'car park' population is doing so well. D. & J. Carr, who have monitored the *Diuris* populations since the 1960s, note (pers. comm.) that it is the more isolated populations of *D. venosa* that have dwindled the most because the feral pig populations are concentrated in these areas.



Diuris venosa

What is being done about the feral pigs? I asked this question of a park ranger and was treated to a 'free ride' through the park to several sites where wire 'traps' had been set. These circles of 'pig-proof' mesh were baited with corn: the animals could push their way into the traps but not out again and once caught could be easily disposed of by the ranger. The pigs could be controlled but not eliminated. Other animals which damage the native orchids of the area include brumbies and rabbits.

As distressing a problem as feral animals may be, the invasion of the park by common broom is a far more insidious one. The dense bushes of the *Cytisus* completely smother out the native plants and they are capable of colonising the frost hollows where *Diuris venosa* occurs. Indeed, common broom has already taken over some *D. venosa* sites. At present, a small amount of experimental spraying with herbicides takes place along tracks and at picnic spots but the only feasible long term control must be a biological one. If the spread of weeds and pigs is allowed to go unchecked, there is little doubt that *Diuris venosa* will be seriously threatened.

The distribution of *Diuris venosa* on the Barrington Tops closely parallels that of the purple eyebright, *Euphrasia ciliolata*. This is not surprising when one considers that *Diuris* are considered to be floral mimics. *D. venosa* flowers are bee pollinated but do not provide nectar; they are, however, of a similar colour to the *Euphrasia* flowers: both are purple and white with a yellow guide patch in the 'throat' of the flower. Observation shows that native bees are consistent visitors to the eyebright flowers where they spend some time working on warm days. Visits to the orchid flowers, however, are much less frequent and short-lived, giving the appearance of 'accidents'. This association of orchids with the *Euphrasia* is an indication of the interwoven web that is our natural environment; for just as the native grasses provide a suitable habitat for the *Diuris*, so are the grasses essential to the semi-parasitic *Euphrasia* which taps the grass roots for part of the food which allows the rapid growth of Euphrasia's short summer life cycle.

Like most *Diuris*, *D. venosa* will freely hybridise with other donkey orchids. On the Barrington Tops grow two other *Diuris*, *D. abbreviata* and *D.* aff. *abbreviata* which both hybridise with *D. venosa*. Crossing is limited, however, by the fact that most *D. venosa* flower after the other *Diuris* have finished. In the New England area, apparent crosses between *D. venosa* and *D. lanceolata* have been collected. Hybridising, however, is not a threat to *D. venosa*. It can instead be seen as a symptom that all is not well.

With luck and careful management, *Diuris venosa* should continue to thrive in the wild. It certainly does well in cultivation and tubers are probably available on request from many specialist growers.

References

Leigh J., Briggs J., and Hartley W. 1981. *Rare or Threatened Australian Plants.*

READERS' FORUM

Native Orchids at the South West Regional Conference at Wagga Wagga in 1989.

Editor:

During the long weekend of 30th September to 2nd October 1989, the Wagga Wagga Orchid Society will host the 8th N.S.W. Regional Orchid Conference.

I have recently been privileged to assist in an Orchid Society of N.S.W. Judging School at Wagga Wagga, at which members of Wagga Wagga, Albury, Griffith and Canberra Orchid Societies participated. To say I was impressed by the enthusiasum and cultural ability of the orchid growers of the South West would be a mild understatement. From a native orchid point of view, I saw some excellent examples of what we have in store for us at the next N.S.W. Regional Conference, and would keenly suggest you make a note in your diary to ensure you do not miss this important event.

One of the excursions planned will be to Livingston State Forest to see native terrestrial orchids in their native habitat; another will be a visit to the local Botanic Gardens.

The South West Regional Conference Show has a most impressive prize list. The Grand Champion is worth $500, the Reserve Champion $200 and eleven other champions at $50, including the Champion Australian Native. Let us see if we can make the Grand Champion a native orchid.

Wagga Wagga is the Garden City of the S.W. Region and has a population of over 50 000.

For further information write to: The Secretary, Wagga Wagga Orchid Society, P.O. Box 224, KOORINGAL. N.S.W. 2650

Walter T. Upton
71 Wesley Street, Elanora Heights, NSW 2101.

FROM THE BACK OF THE BUSHHOUSE

M.A. WEBB
7 Matthew Parade, Blaxland, NSW 2774.

Mark Webb is our Production Coordinator. The role he performs in the production of *The Orchadian* is very much a "behind-the-scenes" job, but one that ensures that you get an quality journal. As Editor, I am very grateful for his contribution and the knowledge of the publishing industry that he has brought to the job of producing *The Orchadian.* Well, now that I have put a big wrap on him, I will let him tell us how we get from the article submitted by you to the finished journal — Editor.

You may have seen my name in the previous issue of *The Orchadian* under the title of Production Co-ordinator and wondered at the time what this title stands for, or, more importantly, what I do with regard to *The Orchadian.*

Previously the job of organizing the production side of the journal fell to the Editor or to a paid middleman. This is no longer the case and since Volume 9 No. 2 I have been co-ordinating the production and distribution of the journal.

Firstly Noel Grundon, our Editor, receives articles from various sources (by the way, have YOU written anything for YOUR journal recently?). The article is then refereed by a recognised authority on the topic. Once an article has been returned by the referee(s) their comments are noted and Noel decides whether to publish the article with necessary corrections or return it to the author. If accepted the article is entered by Noel into a Personal Computer (PC) using a wordprocessing package.

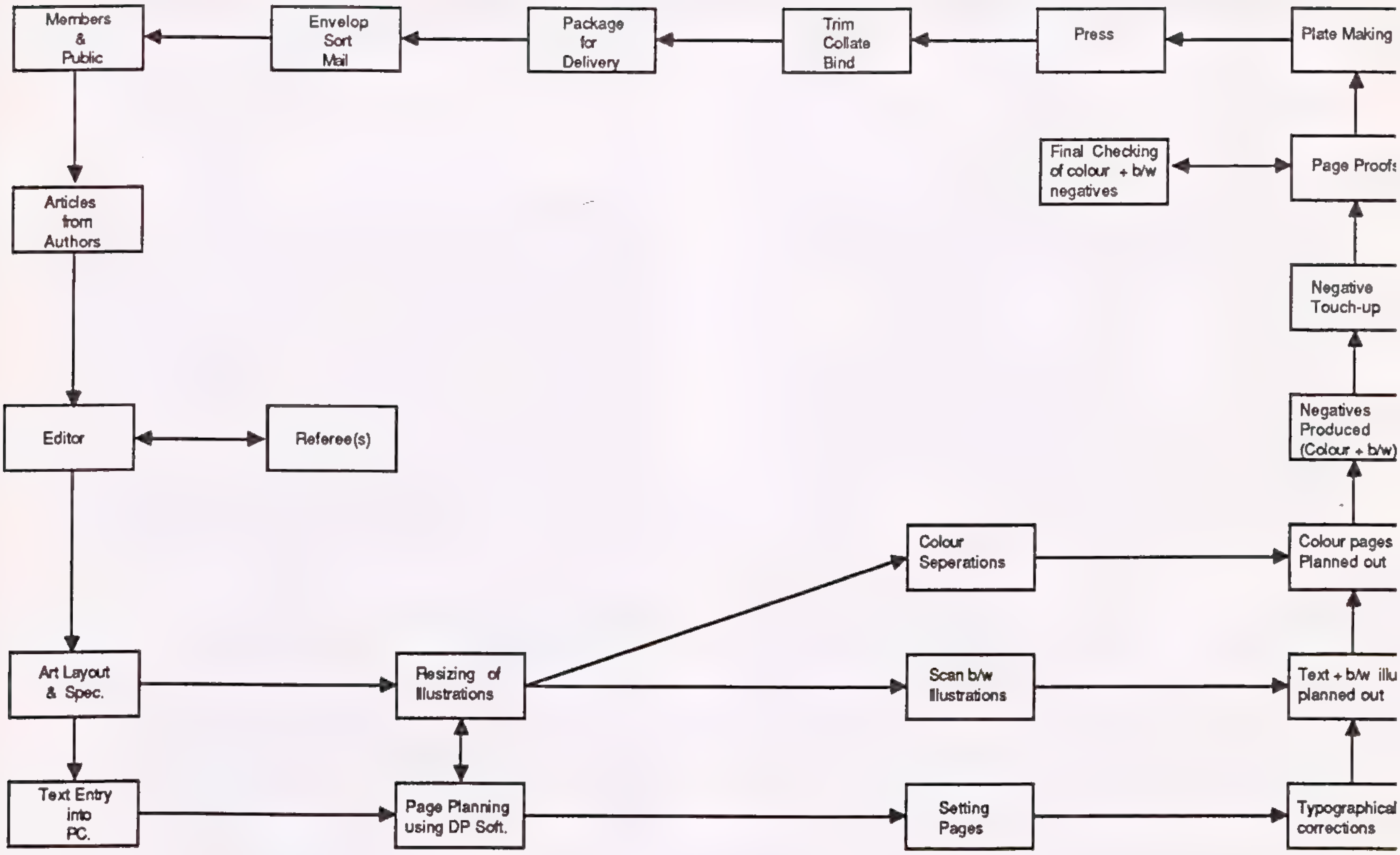
When articles are in the PC, Noel and I discuss the layout plan for the issue. That is a page by page plan showing where each article will be and how much space it covers in the finished journal. Noel then formats the articles using desktop publishing (DP) software into text pages and he leaves holes where we have decided illustrations are to be inserted. These pages are then printed using a laserprinter, and the finished output sent to me in Sydney, where it is proof-read by the Editorial Committee.

The next phase is the final sizing and layout of illustrations, be they drawings, black & white (b/w) or colour photos/slides. Sometimes extra illustrations are obtained to better illustrate certain articles; an example of this was the *in situ* drawing of *Sacrcochilus australis* by John Riley that appeared on the back cover of *The Orchadian* Vol. 9 No. 5.

I then do the paste up of the pages onto boards in a particular order, called a printers imposition (no thats not a Spanish Inquisition), so that when the printer folds and collates the finished journal all the pages are in the right order. Once all the printed pages are laid out, any typographical corrections required by the Editorial Comittee are made.

If there are any black & white illustrations to be inserted into articles I have a film copy of the work made, and add any type, such as drawing descriptions and scales, before placing the finished figure onto the page.

Once I have decided on the final size of the photos, enlargement calculations are done and the slides or photos are sent out to have colour separations prepared. That process involves making four b/w negatives in the primary printing colours, of black, yellow, cyan (blue) and magenta (red). The colour separations are then planned up, that is they are accurately registered over the top of each other on 4 sheets of negative film which have special alignment marks and punch holes in them for the purpose. Image registration is a very important part of the printing process, because if it is not



done accurately the finished colour illustrations will be blurred or may look muddy, due to poor colour registration.

When all the paste ups are completed they are photographed to produce b/w negatives. I then check the negatives and touch up any scratches or other imperfections introduced during the production process.

The negatives are then taken to the printer who makes the photographic printing plates from which the journal is printed. Depending on the type and set up of the printing press, up to 4 colours may be printed in one operation. Once the printed sheets have dried they can be folded, collated, stapled and guillotined. We now have the finished journal ready to be enveloped, sorted and delivered to Australia Post for delivery worldwide.

So you can see that there is quite a lot of work done by various people to produce each issue of *The Orchadian*. How about making our jobs easier by writing the occasional article, or letter to the Editor with some observations be they humorous or serious relating to Australasian orchids. Many members continue to say that *The Orchadian* is too scientific and stuffy, but our editor can only publish what he receives. Hopefully you will have enjoyed the last issue, Vol. 9 No. 6, with its extensive show reports. Some members will have noted that most of the show reports were from the Sydney area where we could beg or harass people into putting pen to paper for YOUR journal. So next time your local group holds a show, be it a 2 week extravaganza or a 1 day, we want to hear about it.

Mark Webb.

BOOK REVIEWS

CULTIVATION OF AUSTRALIAN NATIVE ORCHIDS: SECOND EDITION

By Helen Richards, Rick Wootton, and Rick Datodi. Produced by the Australasian Native Orchid Society Victorian Group Inc. 210 x 145 mm, 96 pages, soft cover, 52 colour plates, 33 line drawings. ISBN 0 9590161 1 2. Published 1988. Price $9.95 plus postage and handling $1.70. Available from The Secretary, ANOS Vic. Group Inc., P.O. Box 285, Cheltenham, Vic. 3192; and Hon. Secretary, ANOS, P.O. Box C106, Clarence Street, Sydney, NSW 2000. Special discount rates apply for bulk purchases.

This is a completely revised edition of the popular book on the cultivation of Australian native orchids written by Melbourne growers from their experience, but adaptive to other climatic areas. After a Preface and Introduction, the text is divided into two parts. Part 1 deals with the culture of epiphytic orchids; Part 2 covers the cultivation of terrestrial orchids. Within each section, the contents follow a logical sequence, beginning with general statements on culture followed by detailed cultivation notes for each species. Subjects covered include containers and mounts, potting mix, potting and mounting procedures, growing environs and housing, watering, fertilizing, pests, diseases, propagation, and source of plants. The book is rounded out by useful appendices where the following subjects are covered: shadehouse construction, month by month culture (in Melbourne), books recommended for further reading, information on the ANOS network, and helpful statistics on the monthly average temperatures (max. & min.) and rainfall for the state capital cities.

The text is clearly written using an economy of words that easily passes on the desired message. Full colour photographs and line drawings, new to this edition, assist greatly in explaining important points of cultivation and pest and disease problems.

The Preface begins — "*This book has been written as a plea for orchid conservation through cultivation ...*" ; those who read this book will be better able to achieve this ambition. This book should be in the library of all orchid clubs and societies and I recommend it to all growers.

Noel Grundon

REPRODUCTIVE BIOLOGY OF ORCHID SPECIES: PRINCIPLES AND PRACTICE

Editor Peter B. Adams. Published by the Orchid Species Society of Victoria Inc. and the School of Botany, University of Melbourne. 292 x 205 mm, 93 pages, soft cover, 13 colour plates, 38 line drawings, 12 tables. Printed by the University of Melbourne, Parkville, Melbourne. Publishing date September, 1988. ISBN 0 86839 957 4. Price $15.00 plus $2.50 postage (surface mail) and handling within Australia. Available from Orchid Species Society of Victoria Inc. Publication Secretary, J. Burke, P.O. Box 303, East Bentleigh, Vic. 3165.

This book has been produced in an effort to encourage people to produce more orchids from seed and thereby reduce the need to raid natural habitats to stock orchid collections. The very low price for this information packed book reflects the heavy subsidy provided by the Orchid Species Society of Victoria Inc. and the financial support from The Australian Orchid Foundation and the Botany School of the University of Melbourne.

Following a Foreword, Acknowledgements, and an Editorial Note, the book contains eight papers by scientists, experienced growers, hobbyists, and commercial breeders. The subject matter covered includes the principles involved in pollination of flowers, practical advice on propagation of orchids from seed, and aspects of the fertility of self and interclonal pollinations of many orchid species. Five appendices contain practical information on raising orchid species from seed by aseptic flasking methods and pot culture methods.

There is a large Australian native species content; four articles deal only with Australian native orchids. All authors have produced readable articles that should be easily understood by the average orchid hobbyist as well as the more technically minded members. Readers who are unfamiliar with the few technical terms in the text will find the glossary at the end of the book good value.

I have no hesitation is supporting the ideals of this book and in recommending it to all growers of species orchids.

Noel Grundon

READERS' FORUM

A Wind of Change?

Editor:

Who's idea was it to grow orchids anyway? I guess it just happened. A friend and I went fishing off Laurieton in northern NSW and, whilst in the area, we visited a couple of plant growers, looking mainly for ferns for my new fernery. As we walked along the rows of *Adiantum*, *Blechnum*, *Davallia* and *Pellaea*, we noticed a basket of "funny looking things" hanging above our heads. This was a basket of *Dendrobium kingianum* and *Liparis reflexa* — and it is upon this basket that I lay the blame for the last three years of orchid growing and all its accompanying frustrations!

Can you remember what is was like to be a beginner in this hobby? I'm sure you have **some** recollection; but can you really remember? Do you remember how hard it was to distinguish a *Liparis* from a *Malaxis*, to separate a *Sarcochilus* from a *Pteroceras*, and to remember which way up a *D. tetragonum* should be hung? I consider myself reasonably clever, but I must admit that these delicate blooms had me foxed.

I suppose the real point of this letter is to suggest that something be done for our beginners to help them through this period. They need assistance with all sorts of things, and most of them need to be "hooked" on our hobby with a flowering specimen, rather than a seedling which could flower in a couple of years. Perhaps some of the following thoughts could give support to this ever increasing proportion of orchid lovers who have gone "native".

The first problem I had was to find plants that I could grow. Most nurseries seem to shun these plants, seeming to lack the buyers, or the methods of successful cultivation that these plants require. I spent months looking for my first *D. falcorostrum*, and even longer to find a specimen *D. tetragonum* that really took my fancy. It would appear then, that one role of ANOS and similar organisations, could be to arrange for more nurseries to sell native orchids. In this way, more of the public would be able to see what we are offering them.

The second problem was to find someone to talk to about orchids. There are rare articles in the "popular" press, and some publications have a regular orchid section. However, it was very difficult for me to find out about ANOS, and I only did so through my connection with the Society for Growing Australian Plants and one of their spectaculars at Castle Hill. The point here is that ANOS and similar groups have a very low profile. To rectify this problem would mean that growers and groups would need to be continually on the lookout for means of publicising themselves. I now know of many growers in my local area, but I have never seen an article in my local paper about orchids.

The next problem was to find some written information about species, their pros and cons, their flowers, and flowering periods, etc. I was fortunate enough to find an early edition of the Melbourne Group's booklet on orchids, and what a special publication it was. Since then, I have acquired a copy of Rentoul's Book 4, and Nicholls, as well as being able to borrow a copy of Dockrill and Laverack from the local library. But initially it was almost impossible to find anything. Perhaps we need another publication, or one which has better distribution into local bookshops, and places such as Grace Brothers and Dymocks. I was taken in by the colour photos in Rentoul's book, so the combination of the practical, simply stated information from the Melbourne group, coupled with some coloured photographs would be a real winner. Add to that some national distribution and this problem is solved.

By now our new grower has been provided with plants, information and a friendly set of contacts ... what else do we need? The next step depends a lot on the person concerned, naturally, but what opportunities should we look to provide? Anybody really interested in the hobby will now look in one of two directions. They will become interested in exhibiting plants, or they will simply grow the ones they have. Obviously, ANOS is interested in the exhibition side of orchids, as this is one way to provide publicity, and to hook new growers. I have found though, that the step between growing and showing is quite a big one. I've been to a few shows, and I realise that it is hard for a new person to enter most of the classes. Not physically hard, of course, but it is hard for them to be a success.

What am I talking about? Let me explain. From a beginners point of view, there would only appear to be one or two classes which give the chance of success. Those classes are the "seedling – first flowering" classes. In this class, you are not competing against those magnificently developed specimens owned by the top breeders and growers, nor those fantastic mature plants that have been selected from a collection of 200 identical seedlings, but you have a chance of buying a seedling, and with enough luck, winning a prize. I know it is impossible for everyone to win prizes, but most Aussies like a fair chance. My collection of mature plants is made up of others' cast offs – not a good basis for equal opportunity!

The other side of the coin is the problem with presentation. How does a new grower know if their XYZ plant is worthy of putting in a show class? In order to solve this problem there is a need to provide beginners with a bit of special help. Perhaps groups could hold special nights when showing, preparing, standards etc. are all discussed. Perhaps a new grower could be "adopted" by a more experienced one. Perhaps classes could be provided for "novice" growers, maybe in their first 12 months of showing orchids. There is also a need for judges to be able to communicate their findings to the grower. Such and such plant is strong in this aspect, but not in this aspect, and that is why it was placed down in the class. In this way, the education of exhibitors is continued, they have a chance of really learning what it is all about. There may even be a need for "open" judging, where exhibitors can see for themselves the intricacies of the business.

I have rambled on enough, and I thank you for your attention. Please understand that I am not complaining when I write about the needs of the beginner, but I feel that ANOS, and native orchid growers generally, have an ideal opportunity to move closer to the attainment of their stated aims: — awareness and preservation. I feel that these aims will not be attained **until** the problems listed above are at least considered. I know you "oldies" can all say that you survived without all this fuss, and look at you now ... but I ask for a broadening of your thoughts, a shifting from the old habits ... a wind of change ...

Chris Gammage (Mr.),
45 Bellevue Street, Blacktown, NSW 2148.

CONTRIBUTION TO THE ORCHID FLORA OF THE *ARAUCARIA* FORESTS IN NEW GUINEA – 6 :*Lepidogyne sceptrum* Schltr.

N.H.S. Howcroft
Forest Research, P.O. Box 134, Bulolo, Papua New Guinea.

A specimen of the genus *Lepidogyne* Bl. was found in a hoop pine (*Araucaria cunninghamii*) forest on top of Mount Morima (around 700 m.a.s.l.) above Ailuluai village, during a seed collecting trip on Fergusson Island in the Milne Bay province (refer Fig. 1). This specimen was identified as *Lepidogyne sceptrum* Schltr. A herbarium specimen is illustrated in Fig. 2.

I have encountered this species in other *Araucaria* forests in Papua New Guinea. The flowering plants are impressive with their tall, thick, inflorescence of orange-red flowers and bracts (Fig. 3), reaching heights of over 1 m (Fig. 4). Without their inflorescence these plants are often mistaken for lilies.

As many people will not be familiar with this genus, a description of the genus is provided before that of the species.

Description of Genus

Plants tall, with numerous crowded, linear-lanceolate, unstalked, non-articulate leaves; **stem** thick; **inflorescence** many-flowered, dense (Fig. 2a); **flowers** medium size, resupinate, pubescent, not widely expanded, subtended by erect bracts, sepals and petals free (Fig. 2 b-c), sepals subequal; **dorsal sepal** forming a hood with petals (Fig. 2b); **lateral sepals** enclosing base of labellum; **petals** unequal sided (Fig. 2f), outer margin mildly lanceolate; **labellum** three-lobed, with a swollen base containing a transverse row of papillose calli; lateral lobes small, erect; midlobe long and narrow; **column** short; **anther** long, acuminate with base enclosed in a long clinandrium (Figs. 2 g-h); **rostellum** long, deeply cleft; **stigma** transverse, covered by a fleshy scale ascending from its lower edge; **pollinia** two, clavate, deeply divided.

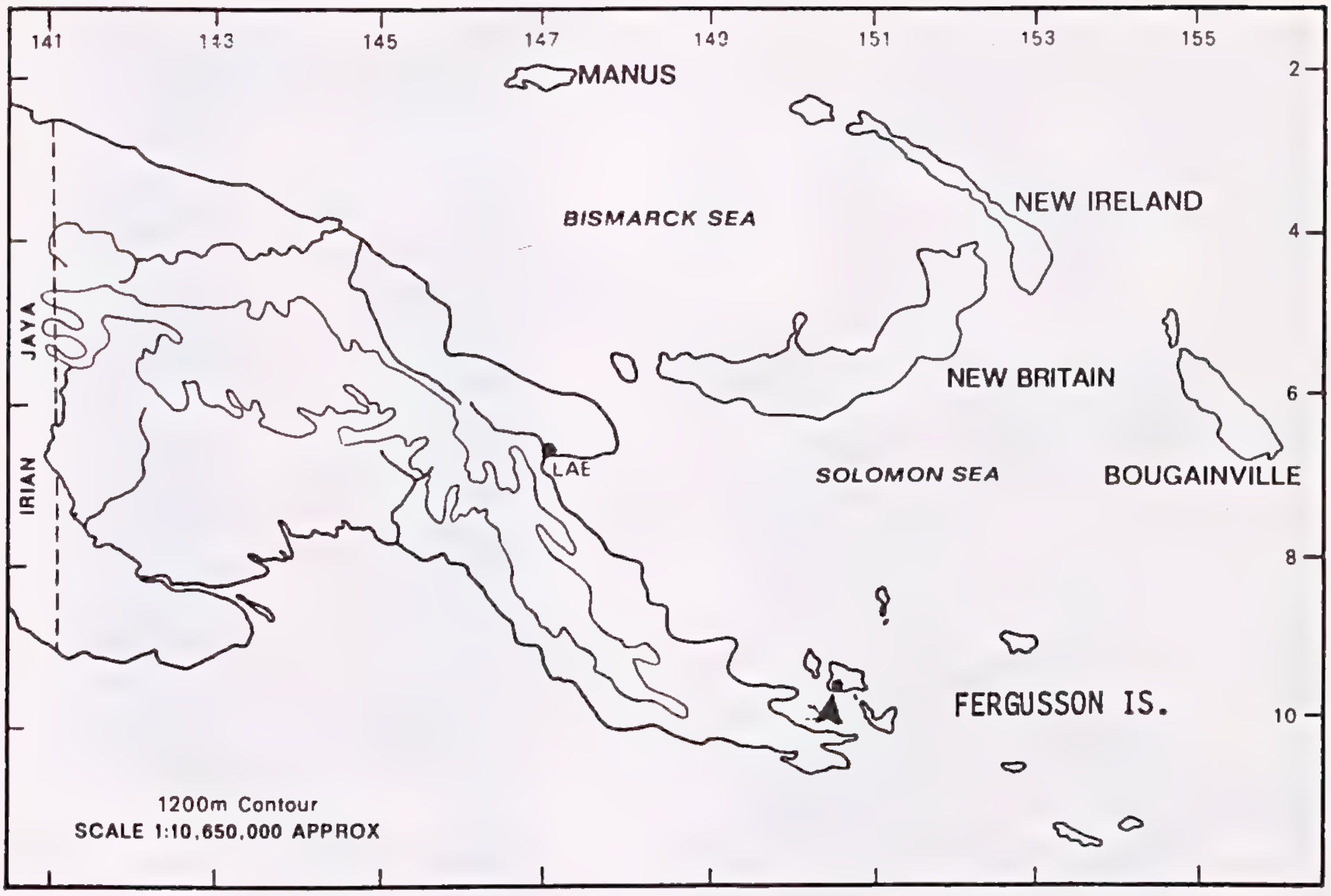


Figure 1. Location of Fergusson Island and Ailuluai Village.

Description of Species

Plants up to 2 m tall; **rhizome** short and forming a stem; **roots** villose; **stem** from the middle section up densely foliated, base cylindrical 1.5-2 cm diameter, terete, flabrous, with some glabrous sheaths and bracts; **leaves** 5-8, erect to patent, narrowly lanceolate-ligulate, acute, base very narrow, up to 50 cm long, middle part up to 5.5 cm wide; **inflorescence** up to 75 cm long, around 4 cm diameter, cylindrical, densely multiflowered, elongate, with erect to patent, lanceolate, acuminate bracts, margins of bracts ciliate, floral bracts shorter; **flowers** erect to sub-erect; **dorsal sepal** oblong-ligulate, obtuse, external surface with glandular hairs, 0.8 cm long; **lateral sepals** obliquely ovate, apically narrowed, external surface with glandular hairs, similar in size to dorsal sepal; **petals** agglutinate to the inner face of the dorsal sepal, obliquely ovate to rhombic, slightly apiculate (Fig. 2f), in part sparsely covered with papillose hairs on the exterior, remainder glabrous, anterior margin undulate, slightly shorter than dorsal sepal; **labellum** more or less globose (Fig. 2c, g), internally with 6 calli, apex of mid-lobe linear, obtuse, decurved (Fig. 2b, c, h), lateral lobe dentiform, obtuse on top, 0.7 cm long, 0.4 cm wide above the base; **column** erect, short, glabrous, the forepart with two fleshy lamina above the stigma (Fig. 2h); **rostellum** ovate-lanceolate, partly bifid; **stigma** margins in the front part thickened; **anther** lanceolate, hood shaped, acute, heart shaped from above; **ovary** cylindrical, with dense, short reflexed, glandular hairs, c. 1.2 cm long.

Distribution

The genus comprises three known species, extending from Malaya through Indonesia to New Guinea. The three species, *L. longifolia* Bl., *L. minor* Schltr. and *L. sceptrum* Schltr., have been recorded in New Guinea at altitudes from 500 to 1100 m.

Habitat

Lepidogyne occurs in forest undergrowth in damp conditions in the leaf litter and soil. The Fergusson Island specimen of *L. sceptrum* was found

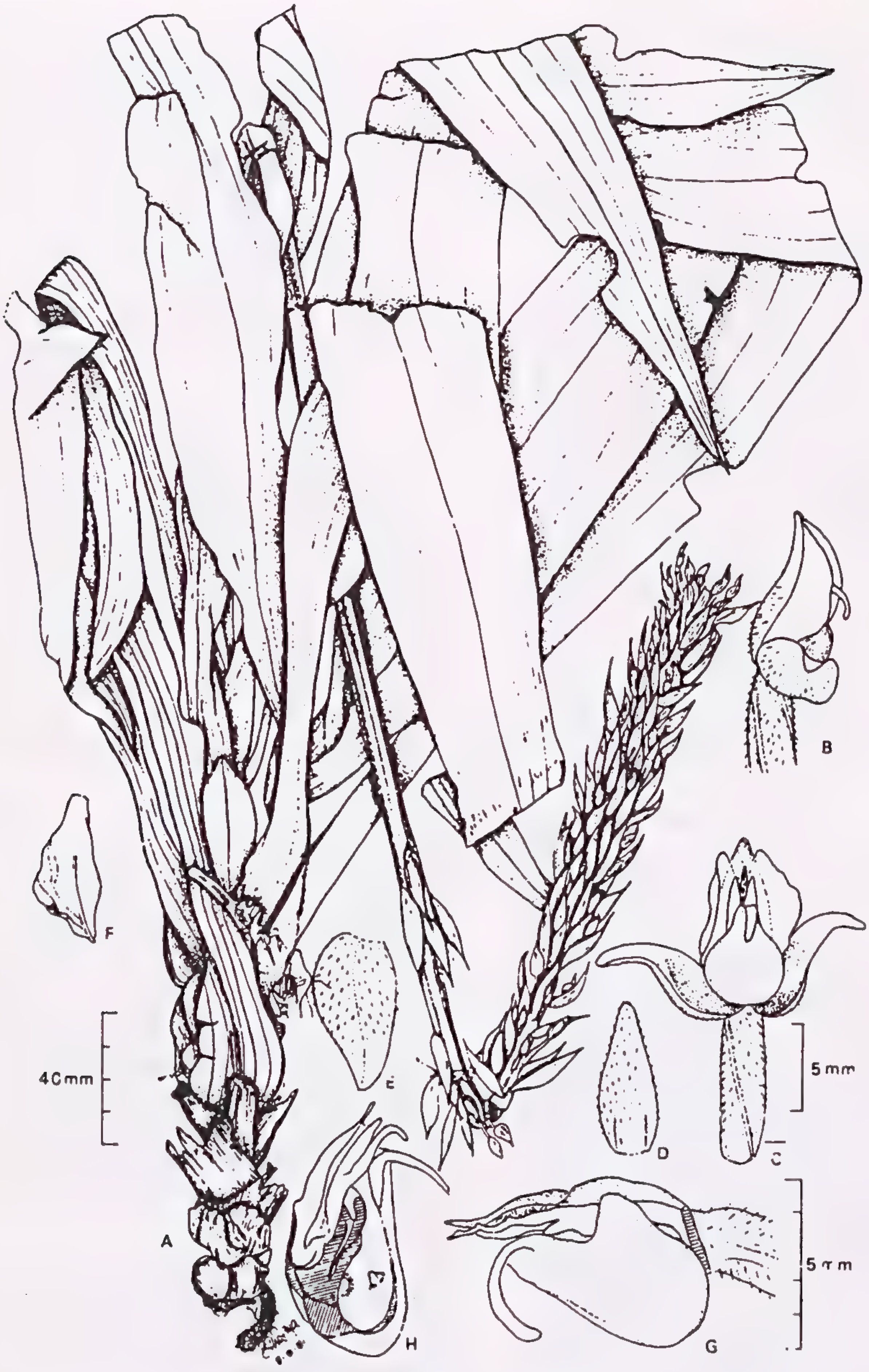


Figure 2. *Lepidogyne sceptrum* Schltr.

Drawn by Emmanuel Saya and author.

A - Habit   B - Flower, side view
C - Flower, front view   D - Dorsal sepal
E - Lateral sepal   F - Petal
G - Column and labellum, side view
H - Median longitudinal section of column and labellum

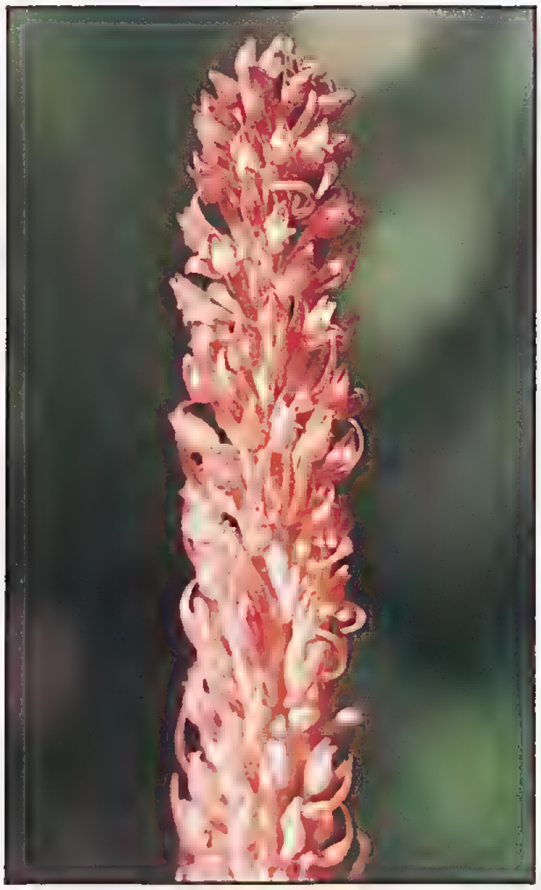


Figure 3. Apical portion of inflorescence of *Lepidogyne sceptrum*.

in a moist depression in the floor of the *Araucaria* forest with only a shallow layer of leaf litter on the floor. The general area appeared to have been disturbed and there was more than the usual amount of light coming through the canopy. According to some of the local people, this may have been caused by cyclone damage to the upper canopy of the trees associated with the *Araucaria*. Annual precipitation for areas where the species occur range from 2000 mm to around 4000 mm.

Cultivation

This species has been successfully cultivated in pots using clay loam and leaf litter, and under 90% to 60% shade. It appears to be essential that the soil is kept damp during dry seasons. The general requirements of this species are much the same as those of *Calanthe*.

Flowering

Schlechter (1914-28) records flowering specimens for June, July, September and January. The Fergusson Island specimen was collected in flower during September 1977.

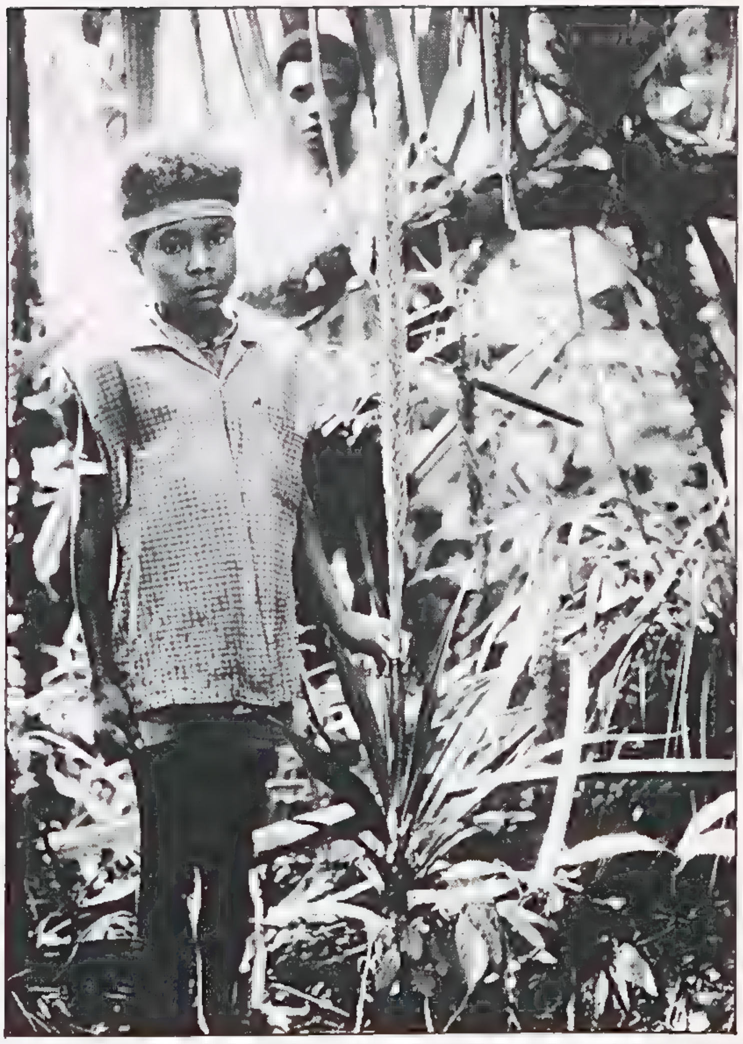


Figure 4. Flowering plant of *Lepidogyne sceptrum*, Fergusson Island.

Conservation Requirements

The species could only be threatened over parts of its natural range by habitat destruction either by logging or by shifting cultivation. Currently this is very unlikely to happen in those areas where this species is known to occur.

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Dear Members,

As you may have noticed in the last issue of *The Orchadian* we are no longer using a page of your magazine to advertise our wares. With the selling off of back issues of *The Orchadian* we are handing this page over to members by reintroducing CLASSIFIED ADVERTISING.

This will be in the form of a trading post where readers can place ads to sell, swap or buy anything at all relating to Australasian Native Orchids. The only restriction is thay such ads must not conflict with the conservation aims of the society, (ie. we will not accept ads for the sale of plants freshly collected from the bush, nor could we publicise a book titled "101 Recipes for Terrestrial Tubers").
What we do want are ads for inclusion in FOR SALE, WANTED TO BUY or FOR EXCHANGE categories for plants, books, badges, seed (something for overseas members to consider) or anything pertaining to Australasian Native Orchids.

This page will be an opportunity for isolated members to place wanted ads for plants, or anything else, they've heard a lot about. Place an ad as a means of contacting other growers interstate or overseas in an area you intend to visit on holidays or simply to become penfriends. You may even be willing to provide guided tours to show off your local area to other enthuasiasts on holiday. Does your society sell items which may be appreciated by a larger group of growers? Just place an ad in *The Orchadian* and let everyone know. Did you deflask a few too many seedlings a couple of years ago which are now occupying valuable space in your bush house? Are you moving house or decreasing the size of your collection for whatever reason. Why not see if an ad in *The Orchadian* can help find new homes for some. Maybe your prizewinning specimen has finally outgrown its pot. The divisions could be sold. Do you flask seed or would you like to contact someone to put down a few pods each year? Try a classified ad.

This is the bit you knew was coming — we are going to charge a nominal fee for this service with all proceeds going toward increasing the circulation of the magazine (a wider market for your ad and a larger choice for readers) and to keeping subscriptions to a minimum. The Classified Advertising rates will be as follows:

1 — 20 words $4.00
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Payment to be included with the ad which should be sent to:

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All cheques should be made payable to The Australasian Native Orchid Society.

Ads must be clearly handwritten or typed (double spaced) and will be placed in the next issue with space available on a first come first published basis. If you want your ad to appear in a particular issue it must be with us at least 3 months before publication as this is when planning of the page will begin.

Dont forget to include a contact name and address and/or phone number in your ad.

These ads are not available to commercial advertisers as they are a special service to readers but anyone interested in commercial ads should write to the above address for our information sheet.

Allison Webb
ANOS Advertising Co-ordinator

ANOS BADGES

ANOS CONSERVATION BADGE

This badge is the first of a yearly series depicting rare & endangered native orchids. ***Diuris purdiei*** was chosen because it's plight typifies the problems facing our Australasian orchid species.

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(Continued from page 147)

leafy and bare, erupt with clusters of brilliant rose-purple flowers with scarlet-orange lips. There is also a rare albino form with a golden-yellow lip. Very similar in habit and common in the Daga is the charming *D. roseipes* which has rose-pink flowers with white tips. Similar again, but long and slender, with smaller deep rose-purple flowers is *D. rarum*.

In another group of pedilonums, the smallness of the flowers is made up for by their brilliance of colour. Two of these are pendulous. *D. caliculimentum* forms rope-like growths up to a metre long with clusters of small pink flowers. *D. alaticaulinum* is a more compact plant with tassels of white to mauve flowers with scarlet lips. *D. dichaeoides* creeps around looking rather like a caterpillar (or a *Dichaea*) and bears dense heads of tiny heather purple flowers. *D. aurantiroseum* is short and compact with pink sepals and orange labellum (Reeve 1983b). The smallest is *D. leucocyanum* whose miniature clusters of flowers are an extraordinary cyan blue colour (Reeve 1983b). Others of which I have single plants include *D. womersleyi* and *D. fractum* (Reeve 1983b). One other pedilonum which I am trying to grow, is the rare and beautiful *D. andreemillariae* (Reeve 1983b), but have not flowered it yet. Its flowers are reputedly magenta in colour with an orange lip, a fitting tribute to its namesake and great orchid collector, Mrs. Andree Millar.

Section *Calyptrochilus*

This section bears a superficial resemblance to *Pedilonum*, but differs in the way the lip is folded in at the top, almost closing the flower, presumably an adaptation to bird pollination. By far the best known and most abundant is the flame-coloured *D. subclausum*, better known as *D. phlox*. Its branched pseudobulbs covered with orange, yellow-tipped flowers are a familiar sight to anyone who has walked about in the P.N.G. highland bush. The little kids on Daulo Pass make wreaths of it and sell them to passing tourists for ten toea. There are many forms (or subspecies?). One from the high forests is very delicate with narrower leaves and deep red flowers with contrasting yellow tips. I think this may be Schlechter's *D. dichroma*. In the Enga Province there is a form with pure yellow flowers which only grows on *Pandanus*, while around Kainantu and Lufa there is a form with salmon-red flowers. A truly wonderful species.

Rather like *D. subclausum*, but more slender and pendulous is *D. dillonianum*, (formerly *D. flammula*), with flowers like glowing embers. At Mt. Kaindi, there is an orchid similar to *D. subclausum* in habit, but with flowers nearer in colour to those of *D. lawesii* – a beautiful rosy purple colour. I believe it may be an undescribed species. Another *Calyptrochilus* we collected from Mt. Balbi in Bougainville has a very slender wand-like habit, and flowers of a brilliant violet colour with cream labellum, very striking.

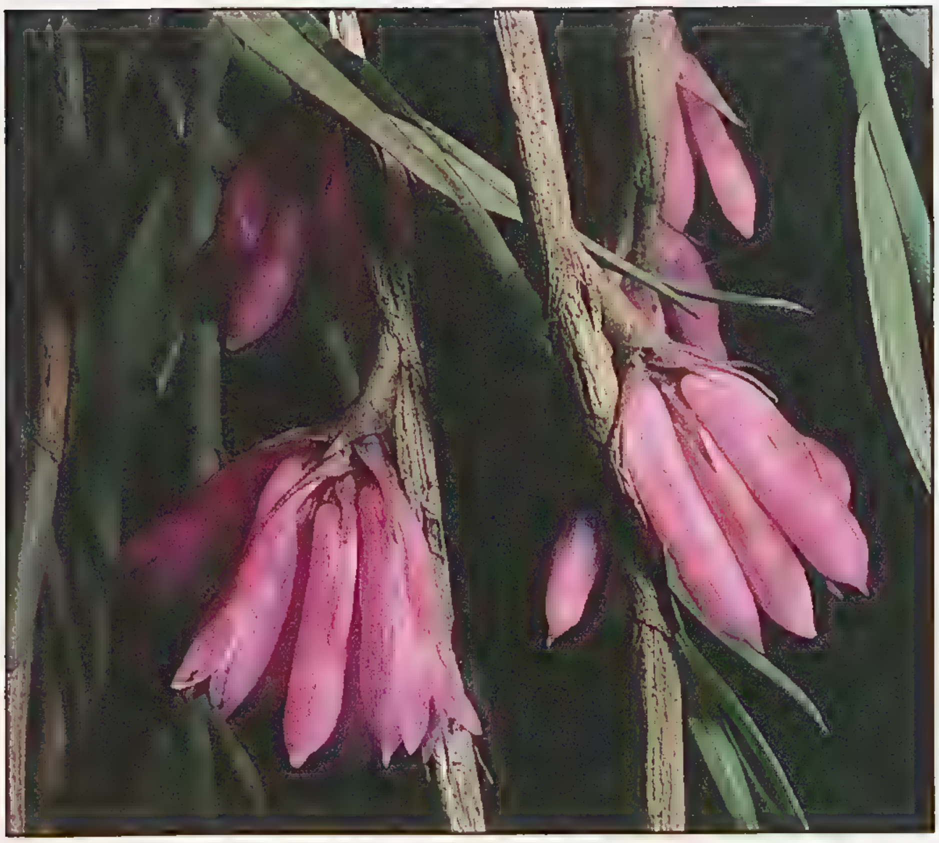
One of the gems of this section is the ever popular *D. lawesii*, named after Dr. Lawes, one of the pioneer missionaries to Papua. This is abundant in the Daga at about 1500 m growing low down on trees in deep shade. It is always pendulous and the flowers are normally blood red in colour, but forms with purple, purple-tipped, orange, or creamy white flowers occur. I shall never forget my first sight of it after toiling upwards all day to a high pass and suddenly seeing this glowing red orchid hanging just above my head, lit by a shaft of sunlight. I did not even notice the leeches on my legs!

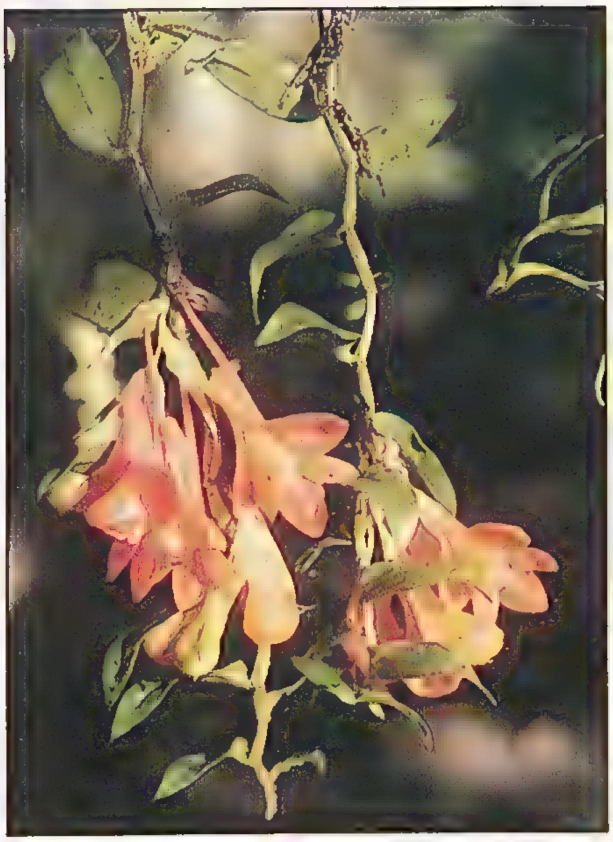
Before I leave this section, I must mention the unusual *D. apertum* which has complanate leaves and a few wide calyptrochilus flowers of a rose-purple shade. Another with wide flowers is *D. wentianum* (name to be confirmed), a high altitude pendulous species with curiously bent-back leaves and large waxy orange flowers. Finally, there is the delightful small species, *D. vannouhuysii*, which creeps amongst moss in swamps and has flat, bright red, yellow-lipped blooms.

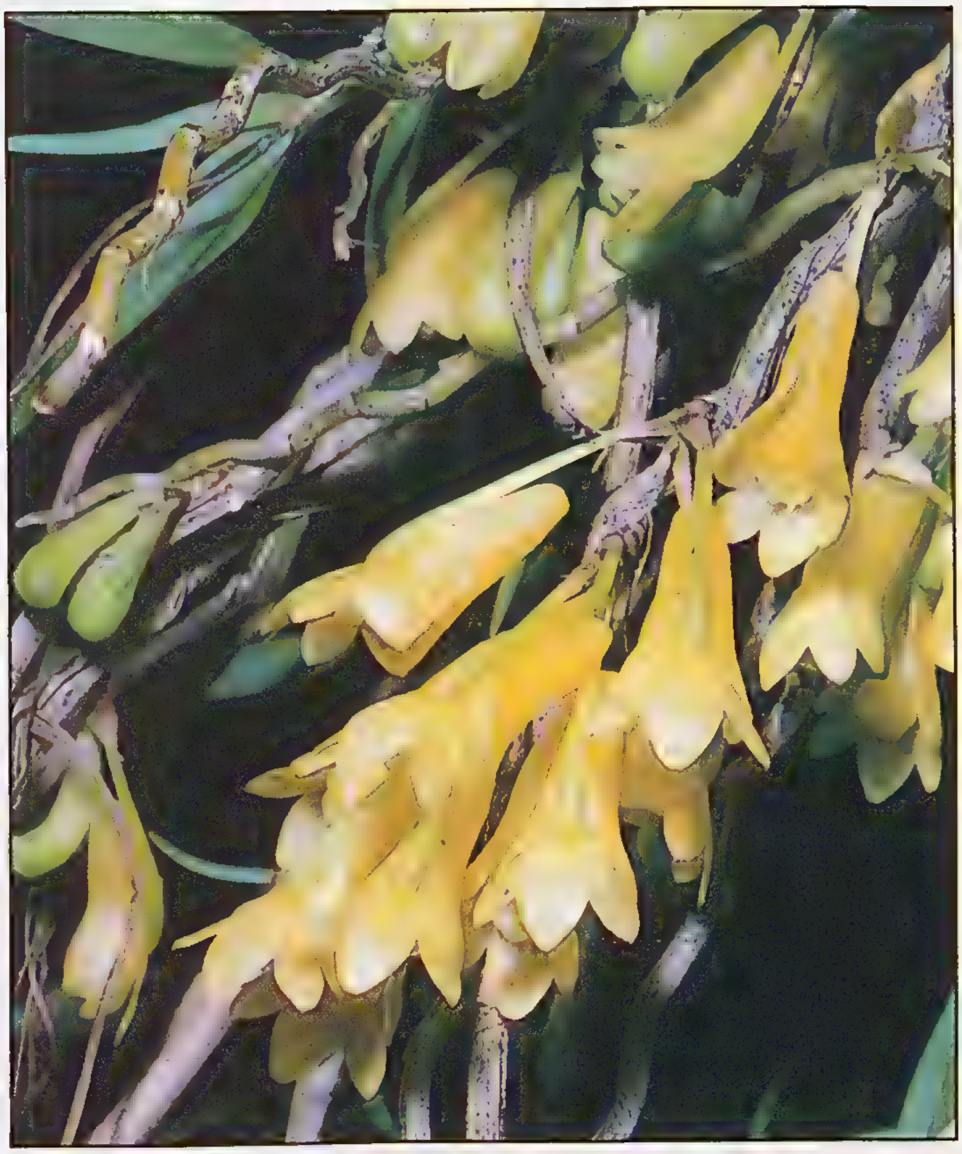
Section *Oxyglossum*: the Gems of the Orchid Family

I think of all the orchid family the most attractive are the members of section *Oxyglossum*, brilliant miniatures of the mountains. I once wrote an article for an American orchid journal entitled 'Twigs Aflame' and I think that typifies this section. They favour the ultimate branches of trees, appreciating plenty of light and air. Species like *D. subacaule* and *D. dekockii* look like sparks in the sunlight.

There is no space to describe them in detail. They all have flowers of a similar shape: triangular and claw-like, with the flat labellum closely appressed to the ovary, the tip sharply pointed and, in some species, recurved. Perhaps the most abundant and well known is *D. vexillarius var. uncinatum* which is common throughout our park in all shades







Above: ***Dendrobium caliculimentum*** R.S. Rogers. Photo courtesy of Mrs A. Millar.

Above Right: ***Dendrobium wentianum*** J.J. Sm. Photo by N. Cruttwell.

Right: This pure yellow form of ***Dendrobium subclausum*** has now been named by Jeffrey Wood at Kew as ***Dendrobium subclausum*** Rolfe **var. *pandanicola*** J.J. Wood in *Kew Bulletin* **41**: 817 (1986).
Photo courtesy of Mrs A. Millar.

of pink to maroon with dark purple lip, its scarlet tip recurved. There are many other colour variations though far less common, including pale yellow, orange, scarlet, and even blue. The last is very rare and is probably a separate subspecies. A narrow-leafed form from Lufa has a pointed lip, green with an orange band and jet black tip. Rather similar to *D. vexillarius* is *D. violaceum* which has linear leaves and larger flowers of a beautiful violet rose shade.

A number of oxyglossums have white to pale yellow flowers. These include *D. masarangense* from Bougainville which has pure white flowers with a citron tip, *D. theionanthum*, *D. sulphureum* and *D. pentapterum* which have pale yellow flowers with a green, orange-tipped labellum, and *D. nebularum* which has greenish or reddish flowers.

D. dekockii which has deep orange flowers, *D. subacaule* with orange to scarlet flowers, and *D. brevicaule* with larger orange flowers, make minute tufts with almost luminous flowers. *D. nardoides* makes a turf of tiny grassy leaves, the flowers being bright purple in colour. *D. hellwigianum* which is common in the highlands, has terete leaves and flowers in a range of colours, including pink, purple and blue. The brightest blue is provided by the minute creeping *D. putnamii* and the exquisite mat-forming *D. delicatulum* whose tiny periwinkle-blue flowers with orange coloured labellum can literally cover the mat of minute leaves and purplish pseudobulbs, making a carpet of delicate colour. Well-named indeed. Last, but not least, and unique in this section in being pendulous, is *D. habbemense* which has flat waxy flowers of a brilliant orange colour. We have all of these growing in the Sanctuary.

The Gem of Them All

Perhaps the best known and most sought after orchid in P.N.G. is the one we have known as *D. sophronites* Schltr, but which has now reverted to its older name of *D. cuthbertsonii* F. Muell. It belongs to a very small section, *Cuthbertsonia.* Its comparatively huge flower lolls on a mat of minute papillose leaves which are usually half buried in moss. The texture of the flower, which is reversed, is glittering and luminous and the flower comes in a whole variety of shades. The commonest shade is scarlet-red, with yellow, red-striped labellum. But it can coloured forms, sparkling gems of the cloud forests. In this section too is the brilliant magenta and orange flowered *D. laevifolium*, but, though growing on the mist-swept ridges of some of the Eastern Papuan islands, it can scarcely be called a true highland orchid. I am growing it at Goroka but have not yet flowered it.

Other Sections

There are many other sections in *Dendrobium*, but I do have not the space to describe all of them here. Some, like *Grastidium*, are one-day-wonders. Section *Rhizobium* contains the Pencil orchids of which we have several, including *D. teretifolium*, but in a different form from the Australian species. The commonest is *D. chordiforme* which has smaller flowers. Another unnamed species with yellow purple-flushed flowers grows on *Casuarina* trees overhanging the Ramu River in an area soon to be inundated by a dam. There are yet others, including *D. araucaricola* which only grows high on hoop pines. I have seen it, but inaccessible to collection.

One *Dendrobium* looks so much like a *Bulbophyllum* that it has been named *D. bulbophylloides.* It creeps all over tree branches in our Park where it be comes covered all over with tiny fleshy brick-red flowers.

I shall leave the terrestrial dendrobiums and the *Dendrobium* allies for my next article to be titled 'Other Epiphytes'. I think it must be agreed that *Dendrobium* is the King of all the orchid genera in the eastern hemisphere, if not in the world. Being epiphytes, they are dependent on trees which are gravely threatened in the world today. Long may they and their hosts flourish.

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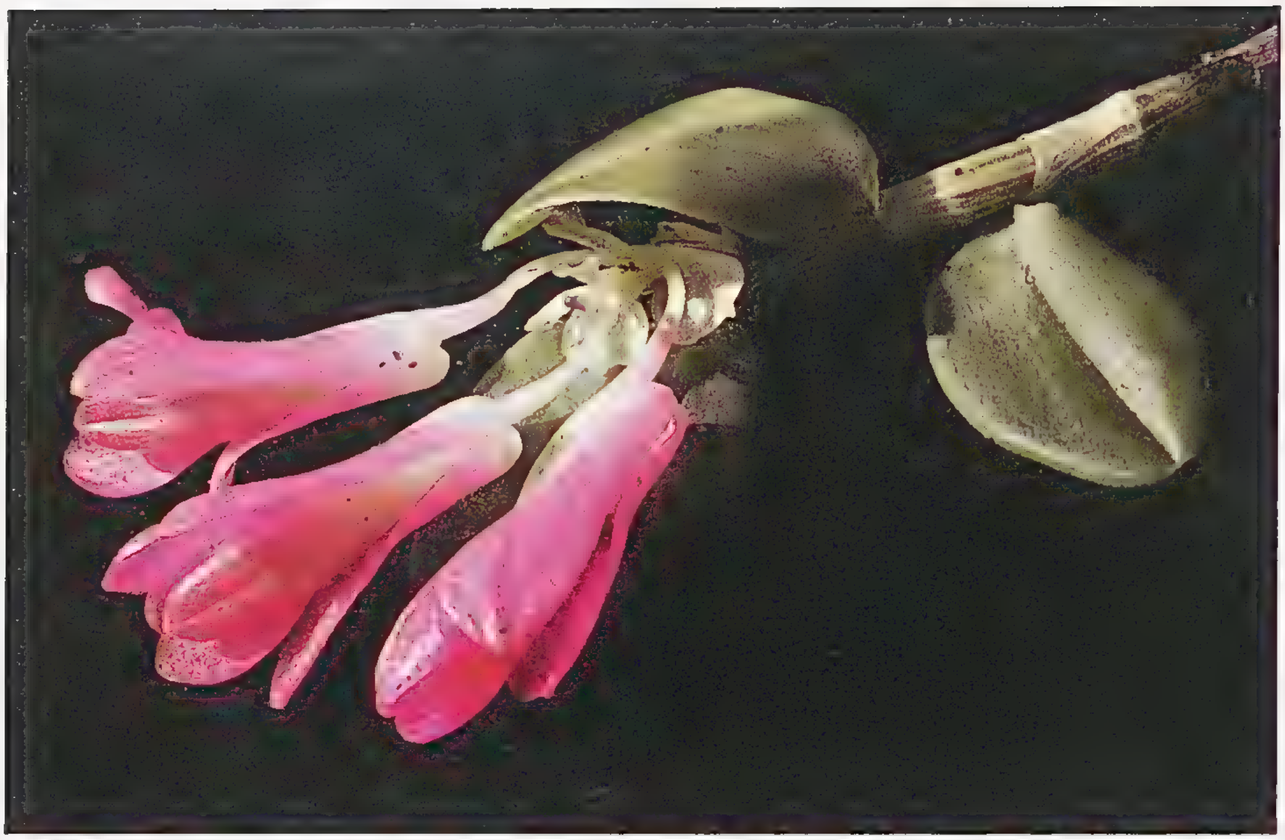
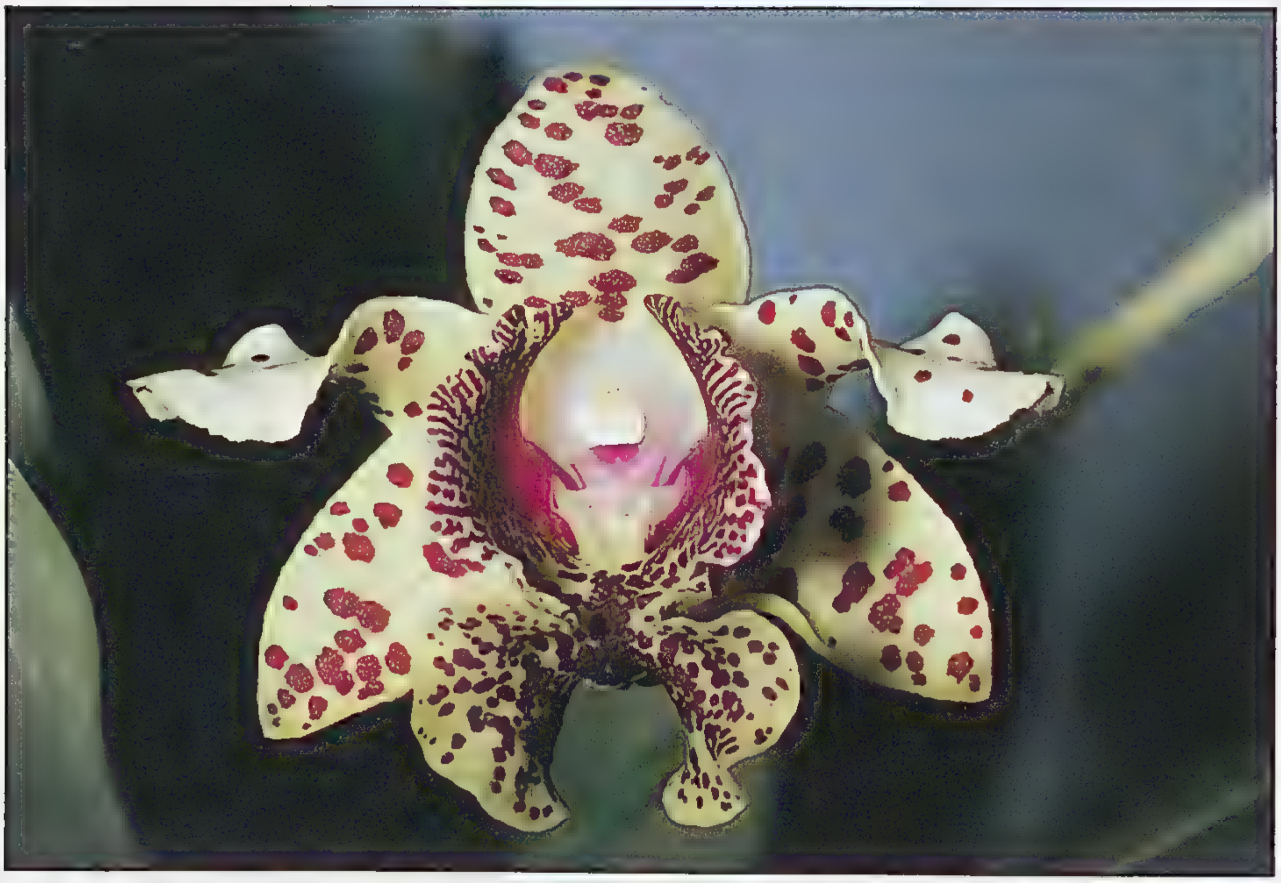


Dendrobium andreemillariae T.M. Reeve
A plant collected in the Paiela area of Enga Province at 3000m in 1982. Photo by T.M. Reeve. (See page 160)



Dendrobium tapiniense T.M. Reeve
Another colourful species from the section *Latourea* which appears to have a limited distribution in the Tapini area of the Central Province of PNG. Photo by P. Spence.

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EDITORIAL

The Australian Orchid Foundation is an organization that should be well known to most orchid devotees, and especially to devotees of Australasian native orchids. But I wonder how many people know the history of this organization, who serves on its committees and executive, and the role it plays in providing funds for the benefit of Australasian native orchids. In this issue, Ron Kerr, a life-long supporter of Australasian native orchids, tells us a little of the beginnings of the Australian Orchid Foundation in his article on our Patron, George Hermon Slade. I am sure that all readers of *The Orchadian* will appreciate the generosity of the bequests made by Hermon Slade to establish organizations such as the Australian Orchid Foundation, and we have all benefited from his foresight and benevolence.

As devotees of Australasian native orchids, we have all benefited from the hard work put in by the founding members and directors of the Australian Orchid Foundation. Such people as Gerald McCraith, Bill Rigg, and the late Bill Paddock readily come to mind. One of the chief functions of the Australian Orchid Foundation is to fund research into orchids. In this respect, research into Australasian native orchids has benefited greatly from the many research projects supported by the Australian Orchid Foundation. One such project is that conducted by Len Lawler of Atherton. And in this issue, Len tells us of the preliminary results of his project. In previous issues, David Jones, Mark Clements, and Peter Lavarack have reported on the results of projects they have undertaken with funding from the Australian Orchid Foundation. In future issues, these and other authors will be reporting on the results of research carried out with the financial support of the Australian Orchid Foundation.

Readers of *The Orchadian* have a special reason to thank the Australian Orchid Foundation. Not all the Foundation's funds go to research – some is used to support organizations which are involved in the native orchid world. Earlier this year, the membership of ANOS had dropped to levels which made continued publication of *The Orchadian* a matter of serious concern. An approach was made to the Australian Orchid Foundation for a supporting grant for the publication of *The Orchadian*. With a grant of $2500, ANOS was able to plan and undertake the recovery of this journal. Sharp-eyed members may have noticed that some of the money from the Australian Orchid Foundation has been used to provide additional colour pages in some issues of *The Orchadian*. We at ANOS Council are most grateful for the support provided by the Australian Orchid Foundation, and hope that our readers have appreciated the generosity of that organization also. If you have, I would gladly publish a letter expressing your appreciation. However, you may wish to contact the Australian Orchid Foundation direct by writing to Mr. Gerald McCraith at 107 Roberts Street, Essendon, Victoria, 3040.

On the subject of membership of ANOS, most readers will be aware of the membership drive that is currently under way. Colorful brochures have been sent to all ANOS Groups and affiliated societies. As a reader of *The Orchadian*, you are a member of ANOS and are therefore very much aware of the benefits you have gained from that association. We are relying on you to spread the word amongst your friends and associates at the local meetings, not only ANOS meetings, but all orchid club meetings. Take a handful of the brochures and sit and talk with native orchid lovers. See how many new members you can recruit over the next few months. A larger membership means a stronger organization supporting better workshops, shows, and publications. In this issue, announcements for the First Australasian Native Orchid Conference are made. Over the next few months, many winter and spring shows will be held. *The Orchadian* continues to improve with new authors appearing and a good supply of articles in store for our readers, including articles on culture like that written by Erhard Husted in this issue. Yes, ANOS is on the move – moving upward to bigger and better things! And a larger membership will ensure that this movement continues. You can be part of this movement by helping to promote ANOS and its membership drive over the coming months.

Noel J. Grundon

NATIVE ORCHIDS OF TROPICAL QUEENSLAND

L.J. Lawler
P.O. Box 58, Atherton, Qld 4883.

Summary: As the largest number of tropical orchids is found in the far north, discussion in this paper will be confined to the coast and hinterland between Townsville and Cape York. In this area, we have representatives of familiar southern orchids plus representatives of the Indo-Malayan orchids both mingling with indigenous species. I do not intend to present a catalogue of tropical orchid species, but rather to discuss a few representative species and in particular where and how they grow.

Introduction

The Australian Orchid Foundation has made available funding for a project entitled "Survey of orchids of North Queensland". I am co-ordinator of this undertaking which aims to establish what species are present north of Gladstone and to plot their range. Success depends on the recruitment of a group of observers who are prepared to survey local areas on a regular basis. In the first year of a proposed five-year period, records are starting to come in, some of which have been included herein. Information forthcoming from the survey will be useful in several ways, including:

(a) recognition of new species for the area;
(b) provision of herbarium specimens of little known species or species poorly represented in herbaria;
(c) provision of material for taxonomic studies of some groups currently under revision;
(d) procurement of seed for use by the Australian Orchid Foundation seed bank or for germination locally, and subsequent distribution of seedlings to relieve pressure on plants in the wild; and
(e) location of endangered species populations to enable initiation of moves to protect the sites.

Early data from the survey have been used to prepare this paper.

We all understand that orchids have adapted to life in various environmental niches, some of which are quite wide and some very narrow. While some species can occupy a variety of niches, some can occupy but a single, highly specialised one. Factors influencing environmental suitability include water, temperature, humidity, light, and air movement, together with access to a suitable substrate for mycorrhizal fungi and/or a suitable source of nutrients. An interplay of some, or all, of these factors plus the availability of suitable pollinators, determines whether an environmental niche can be successfully colonised by an orchid. Scientists classify the landscape using criteria pertinent to their particular discipline, e.g. soil type or vegetation. With my blinkered eyes I classify by orchids, as we all do perhaps unconsciously when we go bush. In fact what we are doing, again perhaps unconsciously, is recognising environmental niches and recording them in our minds.

I will now discuss some orchids and their niches. For convenience, the orchids are divided into groups which I shall call The Southern Genera, The Northern Genera, and The Indigenous Genera.

The Southern Genera Group

When one walks the high country through the grassland of the open eucalypt forest, one finds terrestrial orchids which are much like species from southern parts. Where there is some moisture, along creek banks, in runnels or below rock shelves, we find *Acianthus, Chiloglottis, Corybas* and *Pterostylis*, often in large colonies. *Thelymitra* is here too but extends to drier parts where it can be found, often together with *Diuris,* in sunny, dry grassland, to the west of the ranges. *Caladenia carnea* is equally at home in shady moist areas and in drier, sunny grassland. *Pterostylis mitchellii* is found on the dry western slopes, while *P. hildae* is only on the edge of the rainforest. *Corybas abellianus* is always found right in the rainforest. Colonies of *Arthrochilus* are widely distributed in both lowland and highland situations.

Extending into the area from its main base in the south is a group of familiar epiphytes. The ubiquitous *Dendrobium speciosum* occurs on the ranges and tablelands as far north as the Big Tableland. This orchid can be seen in rainforest growing luxuriantly low down in full shade, or on exposed rocks in part to full sun. In open forest it grows on exposed rocks extending to the west of its range where, as

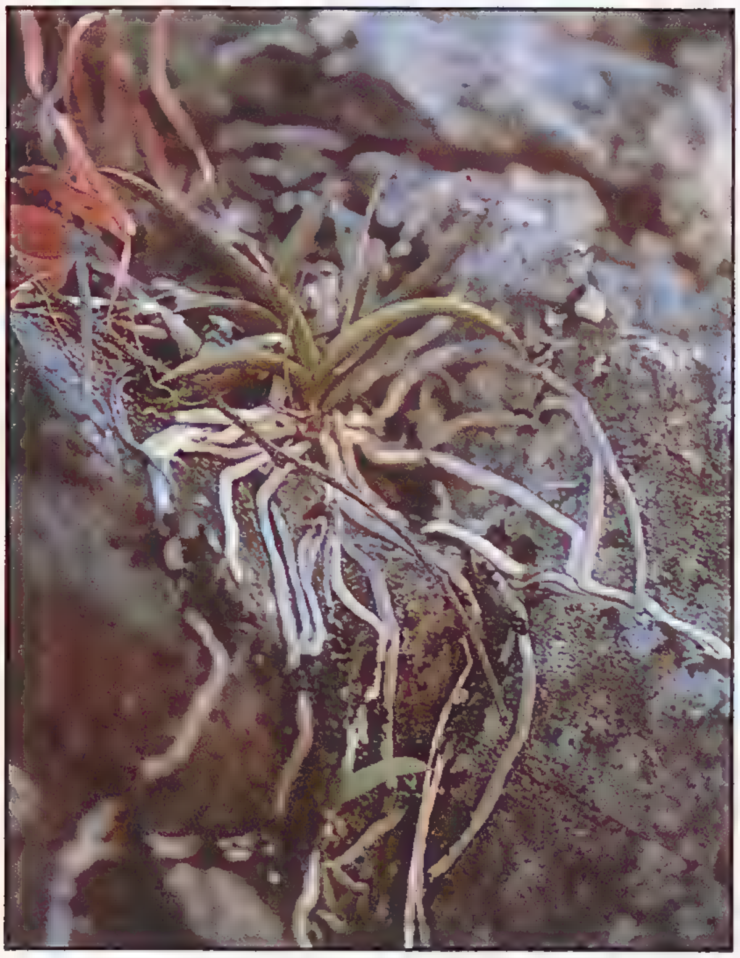

Fig. 1. *Sarcochilus roseus* growing on exposed rockface west of Herberton.

All photos by L. Lawler.

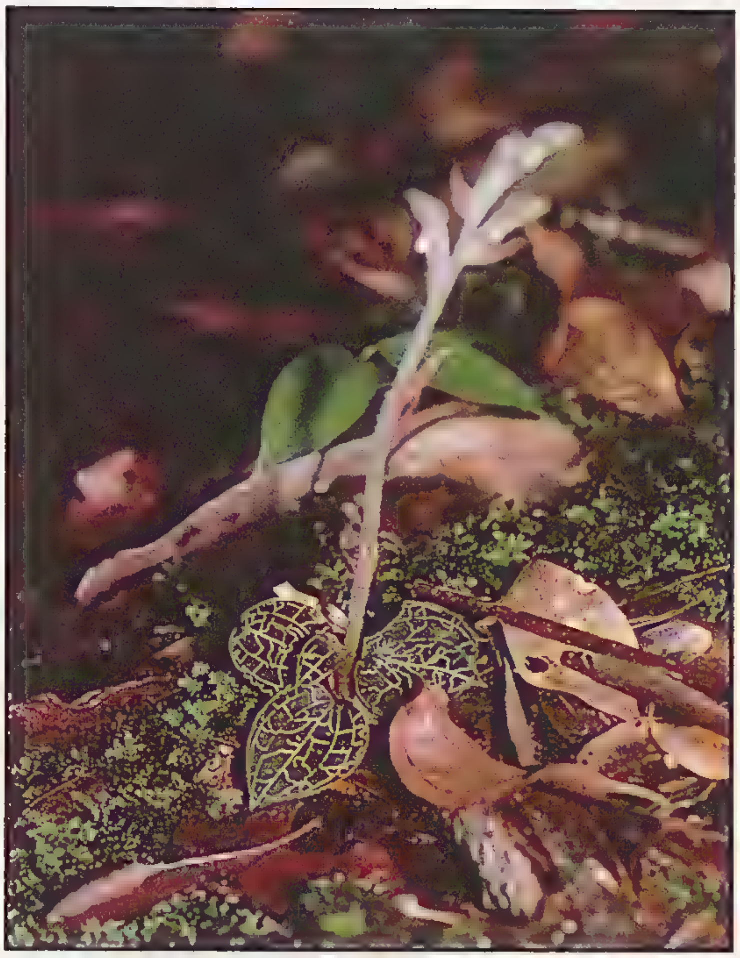

Fig. 2. *Anoectochilus yatesiae* growing on the rocky bed of a runnel within dense rainforest on the Evelyn Tableland.

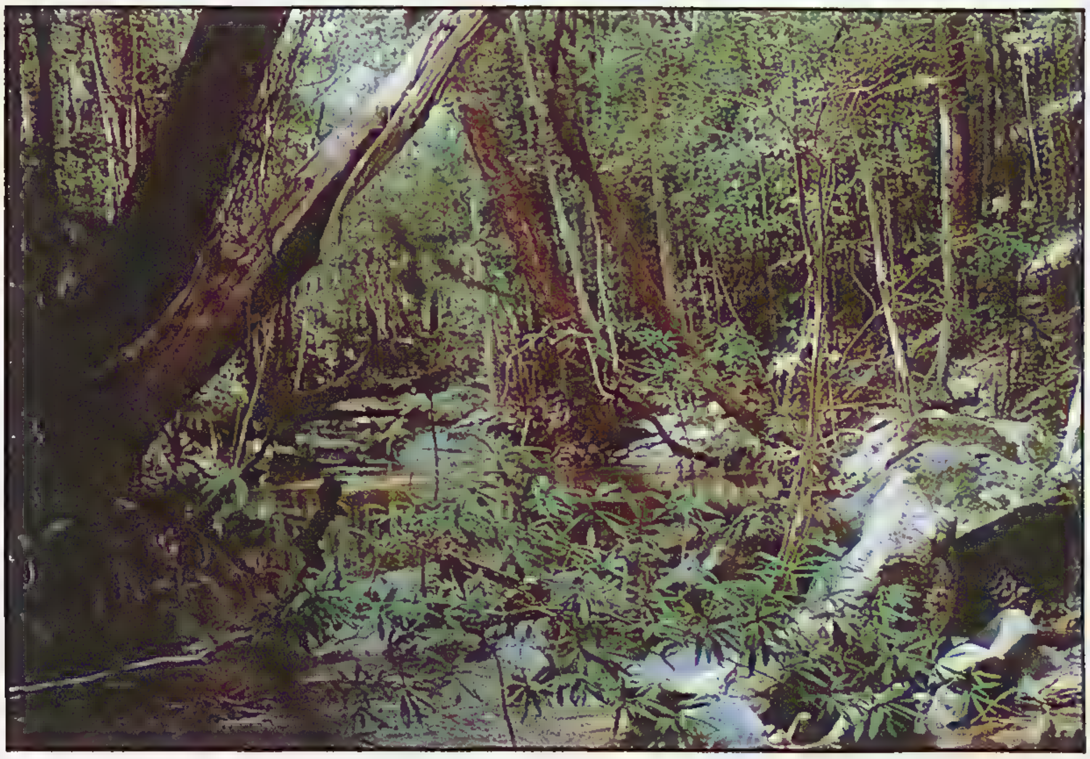

Fig. 3. Upper reaches of Coen River, McIlwraith Range. Orchids growing here include *Dendrobium bigibbum*, *Dendrobium wassellii*, *Parasarcochilus hirticalcar*, with species of *Malaxis* and *Nervilia* in the ground.

variety *pedunculatum* (renamed *Dendrobium pedunculatum* by some authorities; Editor.), it is found in most inhospitable situations high on rocky gorges above dry creeks in full sun. *Dendrobium calamiforme* (previously incorrectly known as *Dendrobium teretifolium* var. *fasciculatum*; Editor.) is even more interfused than *Dendrobium speciosum*, as it occurs on rocks or trees throughout the area from sea level to around 1300 metres, from deep shade in dense rainforest to full sun in dry grassland, where the leaves tend to thicken and shorten. *Dendrobium bowmanii* (previously incorrectly known as *Dendrobium mortii*; Editor.) occurs only in the southern part of the area from the Hervey Range west of Townsville to relic plant communities west of the tablelands, up to 200 kilometres from the coast.

Sarcochilus roseus, which I include here because of its affinity with *Sarcochilus ceciliae*, has a sporadic distribution on the ranges west of the Atherton and Evelyn Tablelands. How this orchid can survive a summer, let alone flower, in its inhospitable home, is beyond me. Perched on rock faces above creeks that flow briefly only after monsoon rains, the plants survive blazing sun which reduces the nearby vegetation to brown tinder. But flower they do, and set seed and multiply and colonise successfully this harshest of niches (Fig. 1).

The Northern Genera Group

The next group to be examined are those terrestrials of northern origin, typified by *Habenaria* and *Nervilia*, genera which flower following the stimulus of monsoon rains. Because of the short aboveground life of these orchids, our knowledge of their distribution is fragmentary, but we are slowly piecing it together. *Habenaria* species have been thought to be confined to lowland areas inundated by the wet, but recent recordings show that some species inhabit also drier, highland areas where the terrain allows some conservation of moisture. *Nervilia* species are plants of the forest floor, where they grow in light varying from dense shade of the monsoon forest to filtered sunlight of the eucalypt forest. They range from lowlands to highlands, where one species extends into dry, open grassland in areas where sufficient moisture is available. The genus *Aphyllorchis* has two species in the area, one lowland, one highland, each found in a similar situation. These saprophytes are found in dense rainforest, growing in deep deposits of leaf litter along the banks of streams where the break in the canopy lets in some light.

Occurring in the south of our area is our sole member of *Anoectochilus*, that splendid genus of jewel orchids. Growing in highland rainforest in the rocky beds of small runnels, and in the leaf litter at the water's edge, the *Anoectochilus yatesiae* plants are inundated after heavy rain but grip the rocks tenaciously (Fig. 2). They grow under a closed canopy in dense shade, but the leaf markings embody organs which act as lenses thus allowing the plants to collect sufficient light to photosynthesise. *Galeola foliata* (renamed *Pseudovanilla foliata* by some authorities; Editor.) is widely distributed in rainforests of the area, where it grows in association with rotting wood. This orchid is a real opportunist taking advantage of heaps of decomposing trees lining forestry tracks, on which it can form quite substantial colonies.

The genus *Dipodium* is represented in the area by three very different species. The leafy species *Dipodium ensifolium* is a very common plant in grassland on the high ranges surrounding the Atherton Tableland. It is found also near sea level in the Mourilyan Harbour – Mission Beach district. *Dipodium pandanum*, a climbing species of New Guinea, has established in the northern rainforests of Cape York Peninsula. A saprophytic species with affinity to *Dipodium punctatum*, has an extensive distribution in the dry country to the north and west of Atherton.

The northern epiphytes which have crossed Torres Strait have quite varied distributions in the area, particularly in respect of southward penetration. *Vanda hindsii* is common in parts of Iron Range and the McIlwraith Range where it can form large, tangled masses on rocks or trees in shady gullies and also in quite exposed situations (Fig. 3).

Dendrobium antennatum appears to be restricted to the eastern area of the McIlwraith Range where it is locally common on trees along creeks at medium elevations. *Dendrobium bifalce* grows on trees at the edge of rainforest at low to medium elevations, and is distributed from near Cape York to the McIlwraith Range where it is not uncommon. It was reported as a rare plant on the upper reaches of the Daintree River some 30 years ago, but there have been no recent confirmed finds in this district. *Dendrobium mirbelianum* is known only from the area between the Daintree and Johnstone Rivers where it grows on trees in the coastal swamps. *Dendrobium luteocilium* has been reported to occur sporadically from Portland Roads to near Tully. A plant of the lowland forests, occasionally ascending to moderate altitudes, it can reach large dimensions and may form huge clumps on rocks or trees. The terrestrial species *Dendrobium lobbii* has been recorded in swampland from Cape York to the McIlwraith Range. It was first found at Rockingham Bay and has not yet been sighted in between these points, leaving a hiatus of some 500 kilometres.

Phalaenopsis amabilis (renamed *Phalaenopsis rosenstromii* by some authorities; Editor.) grows on rainforest trees, or occasionally on rocks, in subdued light at moderate altitudes. It is sparsely distributed from Iron Range to the Seaview Range where it survives quite cool night temperatures. *Bulbophyllum baileyi* has the widest distribution of the New Guinean epiphytes in the area. It is recorded from Cape York south to the Seaview Range, growing in rainforest and open forest, from sea level to around 1200 metres, on trees or rocks often in large mats. It has recently been recorded from much drier areas on the western side of the ranges.

I will conclude this group with three showy orchids which occur in New Guinea but may be considered by some to be Australian, namely *Dendrobium bigibbum, Dendrobium canaliculatum* and *Dendrobium discolor. Dendrobium bigibbum* is the best-known Australian orchid and, in one form or another, is widely distributed in the peninsula from Cape York south to a line joining the mouth of the Gilbert River to Mount Molloy. Reports persist of its occurrence on the east coast as far south as Bowen, but these stand unconfirmed. Due to its horticultural value, this species has been heavily collected and is now virtually extinct in many accessible parts of its habitat. In areas where it has been protected, it is still present in closely packed congregations which give an idea of the immense numbers that must have been present 200 years ago. Its life cycle is in harmony with the monsoonal climate of the dry scrubs behind the dunes and the steep banks of dry water-courses, where it grows on small trees and shrubs, and receives no rain for most of the year.

Dendrobium canaliculatum is widespread from Cape York to well south of the area under discussion, from sea level to moderate altitudes. It grows exclusively on paper-bark type trees in swamp areas near the coast, but tolerates drier conditions in the higher parts of its range where it extends inland to quite dry and hot areas. It is one of the few epiphytes at home in the dry corridors of the Laura basin, and the Townsville – Bowen rain shadow. *Dendrobium discolor* has a range very similar to that of *Dendrobium canaliculatum*, but it is essentially a lowland plant often found on the sea shore where it tolerates salt spray. Growing on rocks or trees in open forests, the plants have very long canes and can form huge clumps. In small numbers it ascends the ranges to moderate altitudes, and recent recordings show that it extends into drier areas of the western ranges.

The Indigenous Genera Group

Those epiphytes that are indigenous to the area are, by and large, plants of the higher country. Perhaps the most widespread is *Dendrobium jonesii* (previously incorrectly known as *Dendrobium ruppianum*; Editor.) which occurs from Iron Range to well south of the area under discussion. Although occasionally found near the coast, it is an orchid of the ranges and tablelands, where it is found in rainforest on trees or rocks (Fig. 4), and in moist open forest where it favours *Casuarina* species. It also has a very limited distribution in isolated pockets of drier country to the west of the tablelands. This species exhibits variation in relation to the altitude at which it grows. Plants of the higher country are more robust, flower later and have larger flowers culminating in the subspecies *bancroftianum* (previously known as *Dendrobium ruppianum* var. *magnificum*; Editor.), found only above 900 metres with flowers usually pure white reaching twice the size of those of plants from lower levels. To a lesser extent this phenomenon is exhibited by *Dendrobium agrostophyllum* which occurs only in the high country between Cooktown and Paluma where it shares the habitat of *Dendrobium jonesii.*

Dendrobium fleckeri has a disjunct distribution between Cooktown and Innisfail, where it occurs on the ranges above 900 metres growing on trees or less often on rocks in dense shade of the rainforest often accompanied by *Liparis fleckeri* and *Cadetia taylori.* At very high altitudes it grows exclusively on rocks and has a very stunted growth. *Dendrobium carrii* has a similar distribution to *Dendrobium fleckeri*, but it grows only on small branches high up in the light. *Dendrobium fellowsii* (previously incorrectly known as *Dendrobium bairdianum*; Editor.) is

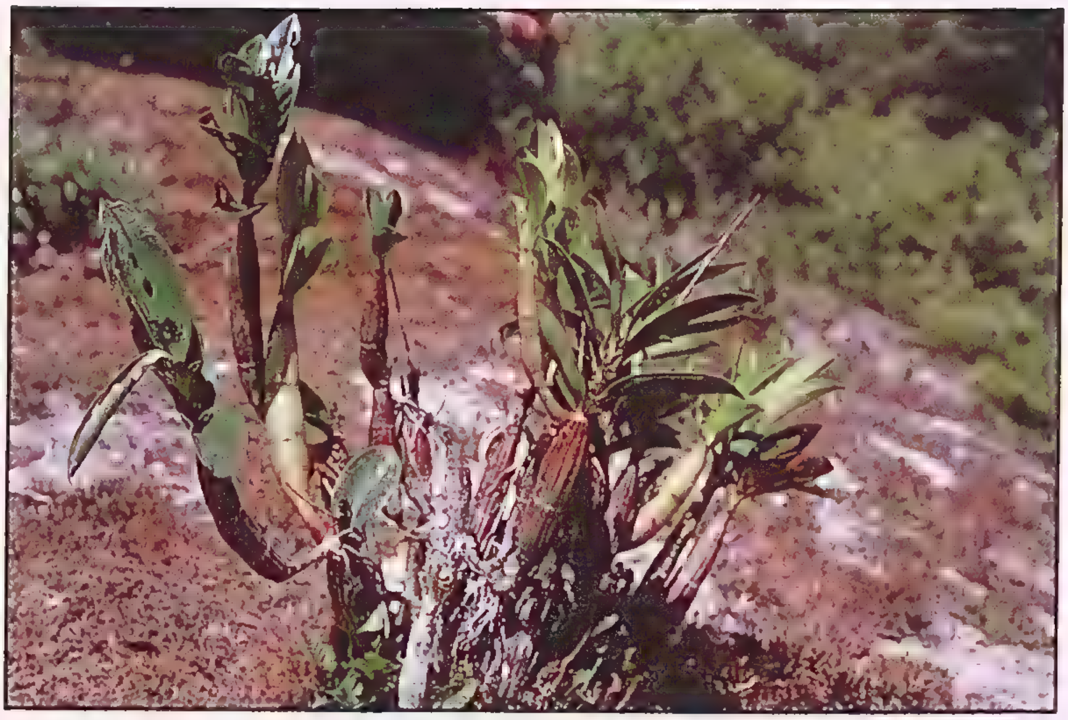

Fig. 4. *Dendrobium jonesii* on an exposed granite outcrop near Mt. Lewis. The production of aerial growths, unusual in this species, may be a response to harsh conditions. However, the plants flower well and set seed and prosper here.

widely, but sporadically, distributed on the ranges from Windsor Tableland to Paluma. It grows on trees in open forest from high to moderate elevations and occasionally descends to lower areas towards the coast.

The two miniature species, *Dendrobium lichenastrum* and *Dendrobium toressae*, have a similar distribution from near Cooktown to the southern limit of the area, except that the former species extends much further south. They often form extensive mats on trees or rocks in rainforest and adjoining open forest at moderate to low elevations. *Dendrobium wassellii* is confined to the McIlwraith Range where it occurs in upland forest, usually on *Araucaria* trees, extending to more open areas on the forest edges.

Pteroceras hirticalcar (renamed *Sarcochilus hirticalcar* by some authorities; Editor) also is confined to the McIlwraith Range where it grows on trees, often on small twigs, generally along creek banks in the rainforest and adjoining open areas. It was once thought that this species was restricted to a very limited area but recent sightings have greatly extended its range within the McIlwraith Range area. *Mobilabium hamatum* occurs from near Cooktown to the southern extent of the area, growing on trees in the rainforests of the ranges and tablelands. *Phreatia baileyana* is distributed from south of Cooktown to Paluma, where it grows in the rainforest on the ranges and tablelands at moderate to high elevations. *Phreatia crassiuscula* has a similar distribution but grows also in the open forest at moderate elevations. Both species grow on trees, fairly high up in good light. *Saccolabiopsis armitii* is confined to trees of the drier forests from the Iron Range region to well south of the area under discussion. It is found in relic dry scrubs sometimes at a considerable distance from the coast.

Conclusions

Having discussed a selection of orchids from various groups within the area, what general observations can be made?

What is most striking is that orchids are almost everywhere. They are present continuously from north to south, in the wet areas and the intrusive dry corridors, from sea level to near the summit of Mt. Bartle Frere, from coastal mangroves and ti-tree swamps to the hot grassed woodlands and dry scrubs of the hinterland. It is the high ranges and tablelands that are host to the most numerous and varied orchid communities. From grassland and open forest, through rainforest to cloud forest, there are abundant terrestrial, epiphytic and lithophytic species all enjoying adequate water but preferring, or perhaps tolerating, different degrees of humidity, temperature, light, and air movement, as is evident from their varied distribution within a locality and their stratification as elevation changes. In this environment, conditions are eminently suitable for the growth of fungi and lichens, on the bark of trees, on rocks and in the leaf-litter of the forest floor, thus ensuring mycorrhizal partners as needed. The evidence of seed set shows the availability of pollinators.

It is clear that, as a family, orchids have been successful in colonising most of the environmental niches in the area. However, as species, it is clear that some are more successful than others, in that they occupy extensive or varied habitats, while some occupy only limited zones. No doubt the reasons for these differences are many and varied; some we cannot fully understand within the limits of our present knowledge, while we can make educated guesses at others.

Be this as it may, here in this area is a multitude of environmental niches complete with the necessities of orchid life. The result is a pot-pourri of species, a veritable wonderland of orchids. From the giant canes of *Dendrobium discolor* to the tiny pseudobulbs of *Bulbophyllum*, from the large perfect flowers of *Phalaenopsis* to the microscopic ones of *Oberonia*, from *Dendrobium nindii* in the crocodile-infested mangroves, to *Dendrobium jonesii* ssp. *bancroftianum* on freezing Mt. Bartle Frere, to *Sarcochilus roseus* bravely flowering in searing summer heat – orchids are everywhere.

SALUTE TO GEORGE HERMON SLADE: AUSTRALIAN ORCHID FOUNDATION AWARD OF HONOUR

Ronald Kerr
260 Geoffrey Road, Chittaway Point, NSW 2259.

I first became aware of Mr. George Hermon Slade at the December 1953 meeting of the Orchid Society of N.S.W. I was to learn later that he was a founding member of the society.

At that meeting, Hermon gave a short talk on the growing of orchids on trees. I was intrigued. Most of the cultivated orchids, he pointed out, were epiphytes, plants which grow on trees in nature but not as parasites. Suitable garden trees can be used to grow orchids, even some which may not respond well to pampered glasshouse conditions. He had found jacaranda and frangipani trees very suitable. Both these trees tend to lose leaves late in winter, thus allowing supported epiphytes to receive extra light. They both had non-deciduous bark. He had heard of cases where citrus trees had been used with success.

At that time I did not have any suitable trees. However when Mr Slade senior issued a general invitation to society members to attend an open day at his Manly home, I made a point of going. The house was on the harbour front and on the terrace, a large frangipani tree was covered with happy orchid plants. Hermon made this tree famous by his articles about the orchids it hosted and their background and culture.

A few years later, I began contributing articles to the *Australian Orchid Review.* Hermon had been the founding editor. The early copies were largely financed by Mr. Slade senior, and by advertisements from his companies. Business pressures forced Hermon to relinquish the task. In 1960, Hermon again became editor. The issues of this period are filled with wonderful articles on species orchids. About this time Hermon met the late Kip McKillop of Arawa plantation (now the site of a city) on Bougainville Island and made several trips to Papua New Guinea. Kip had established a ten acre plantation of trees as hosts for orchids, and had travelled PNG to stock it. Hermon did not need to be hooked on New Guinea orchids – his enthusiasm even surpassed Kip's. Soon he was travelling all over the country and making friends with its hobby growers and such well known orchidologists as Andree Millar and the late John Womersley.

The potential for innovative hybridising was so apparent that he lost no time in matching desirable partners. In the 1960's, such Slade hybrids as *Dendrobium* Alan Mann (Caesar x *ostrinoglossum*), *D.* Aropa (*johnsoniae* x *forbesii*), *D.* Gertrude Persson (*veratrifolium* x Pompadour), *D.* John Gunther (*veratrifolium* x *ostrinoglossum*), and *D.* Nellie Slade (*atroviolaceum* x *forbesii*) were registered.

Hermon Slade peppered the *Australian Orchid Review* with intriguing data on Papua New Guinea species, illustrated by beautiful black and white photographs. The cost of letterpress colour blocks (a cheaper process is used today) was such that only one illustration in colour was then possible. This publicity resulted in many Papua New Guinea species being brought into cultivation by Australian and Hawaiian growers. The long list includes such species as *D. tapini, D. tangerinum, D. rhodostictum* and *D. ostrinoglossum* (now correctly *D. lasianthera*). All are now well known names in hybridising.

It was natural for Hermon to become enthused by the people of Papua New Guinea and their culture. I remember standing with him on the Aropa airstrip watching a crowd of indentured workers waiting for the plane which would take them homewards. They were a jolly crowd but individuals varied greatly in skin colour, stature, and hair style. The plane was late so Hermon played a game of identifying where each had come from When each one was asked he confirmed Hermon's appraisement.

This interest in the region's people led to Hermon founding the New Guinea Biological Foundation. Its object was to improve village life by the introduction of new and improved fruits and vegetables. As a base for this research the Foundation, largely financed by the Slade Family Trust, bought Aropa plantation. The aim was that the plantation income from cocoa, copra, and rubber latex should support the Foundation in perpetuity.

Hermon has adopted this principle on many occasions, the theory (and how sound it is) being that where a small amount of money could be used as a catalyst to further a larger viable and worthwhile project then it was worth consideration.

When the upsurge in the growing of native orchids started in the late sixties and early seventies, Hermon lamented the fact that there was no large public living collection anywhere in Australia. He offered $10 000.00 to anyone or any organization prepared to undertake such a project.

Several applications were made but all lacked any prospect of continuity. There was one vital response however. It came from Mr. Gerald McCraith of Victoria, well known for his work as Victorian Orchid Club President and as second President of the Australian Orchid Council.

Gerald suggested that they join forces in forming an orchid foundation. Initially this was funded by Hermon and Gerald, and a few others. It was decreed that only the income from the capital be used, and then only for a proven educational or scientific project, again on the catalyst principle. Over the years, taxation deductible donations from growers and societies have been substantial.

For over twenty years the Foundation has financed, or more generally part financed, such educational projects as workshops, scientific research, botanical field work, and conservation. It established the world's first orchid seed bank, and has assisted in the establishment of public orchid displays by responsible bodies. Otherwise hard to get orchid books have been imported for sale at discount prices, and important works have been published. The list could go on and on.

A recent and important grant made by the Foundation was the sum of $2500.00 for the revitalization of *The Orchadian.*

Recently, Hermon demonstrated a spectacular example of the catalyst principle when he donated half a million dollars for the building of an orchid house in the Royal Botanic Gardens, Sydney. Stimulated by this, the government added another three and a half million to create a complete glasshouse complex, due for opening in 1989.

Hermon Slade has never been a person to seek publicity, so he may not be so well known to the modern generation of orchid growers. But for over fifty years his influence in the world of orchids has been substantial.

I have been fortunate to have known him for many of those years, and he has inspired me to learn something about them, something of the mystic which raises orchid growing beyond being a mere hobby. I know he has worked selflessly to help others to do the same.

For his many contributions to orchidology, I was pleased to have a small part in nominating Mr. George Hermon Slade to be a recipient of the AOF Award of Honour.

READERS' FORUM

"Uses" of Orchids

Editor:

I read with interest the article by Tim Low in the September 1988 issue (Vol. 9, No. 5). He adds to our knowledge of this interesting subject, particularly in respect to his personal experience in tasting tubers.

For the last 25 years, I have been interested in "uses" of orchids, both native and exotic, and have had several papers published on various aspects of orchid use. As both Beth Gott and Tim Low seem to be unaware of these writings, I seek the opportunity to cite two articles which may be useful to readers of *The Orchadian* who are interested in this aspect of orchid study:

Lawler, L.J. 1981. Ethnobotany of Australian Orchids. *Proc. XIII Inter. Bot. Cong. Orchid Symp.*, 86–88. Orchid Society of New South Wales, Sydney.

Lawler, L.J. 1984. Ethnobotany of the *Orchidaceae*. In *Orchid Biology: Reviews and Perspectives, Vol. III.*, 27–149. Ed. J. Arditti. Cornell University Press, Ithaca, New York.

The former article briefly sets out uses of Australian orchids, while the latter chapter treats these matters in detail with extensive references. This chapter also includes a comprehensive section on salep. The beverage served in the salopian houses of the London of Lamb and Dickens was usually prepared from sassafras chips rather than orchids.

L.J. Lawler,
P.O. Box 58, Atherton, Qld. 4883.

BOOK REVIEW

THE ORCHID GROWER'S MANUAL

By Gordon C. Morrison. Published by Kangaroo Press Pty. Ltd. 220 x 140 mm, 247 pages, hard cover, 3 colour plates, 6 black and white plates, numerous line drawings, graphs, tables, and figures. Published 1988. Price $29.95. Available from Kangaroo Press Pty. Ltd., 3 Whitehall Road (P.O. Box 75), Kenthurst, NSW 2156.

The field covered by this book is unique and there is nothing else like it available for students of orchid growing. It is part textbook, part reference source, and part primer, describing how plants grow and react with their environment. A great deal of research has been carried out on plants; a significant amount of this research has been undertaken on orchids. But a great deal of this information is scattered over a wide range of scientific journals and textbooks and is not readily available to the orchid grower. The manual brings this information together at a basic or elementary level and thus is a useful reference source to be taken down from the shelf when the most fundamental question is to be answered. After reading this manual, any orchid grower will look upon his orchids with very different eyes and more understanding of what an orchid has to do to live and grow.

Gordon C. Morrison is the author of *Growing Orchids in Australia and New Zealand* and co-author of *Growing Geraniums and Pelargoniums in Australia and New Zealand.* He has worked with horticultural plants for over 30 years, with orchids taking precedence for the last 16 years. He is therefore well qualified to write *The Orchid Grower's Manual.*

He has written a very readable text, lavishly illustrated with linedrawings, figures, tables and graphs, making reference easy and quick. The book consists of thirteen chapters and three additional topics. The chapter topics include Measurement, Classification and Nomenclature, Chemistry, Anatomy, Radiation, Plant/Climate Relationships, Sun Movement, The Biochemicals, Orchid Nutrition, Photosynthesis, Respiration, Genetics, and Experimental Methods. The three additional topics given after Chapter 13 are: "Mineral Nutrition of Epiphytic Orchids in the Tropical Forest", "The Microclimates of the Tropical Forest", and "Coupling Orchids to the Atmosphere. A useful glossary provides a ready reference for the many scientific and technical terms used throughout the text.

Although written in an easy-to-read style and well illustrated by examples, the subject matter is technical and may prove to be difficult to understand at first reading for many hobbyists who do not have a background in biology and chemistry. Never-the-less, the manual should be on the bookshelf of all serious orchid growers and all orchid clubs and societies in order to answer those technical questions which, from time to time, arise in discussions between orchid hobbyists.

Noel Grundon

DATE CLAIMERS

Toowoomba Orchid Spectacular and Conference '89.

From 18th to 24th September, 1989, the Toowoomba Orchid Society Inc. and the Native Orchid Society of Toowoomba Inc. will host the Toowoomba Orchid Spectacular and Conference '89 in the week prior to Toowoomba's famous attraction *The Carnival of Flowers*. For over 25 years, a prominent feature of the activities during Carnival of Flowers week has been an orchid show where native orchids have shared pride of place with exotic species and hybrids. In 1989, visitors have the opportunity to visit two orchid shows, the Orchid Spectacular and Conference in the week prior to the Carnival of Flowers week, and the usual orchid show during Carnival week.

Pre- and Post-conference tours as well as day tours during the conference have been organised. Guest speakers during the conference include Geoff Stocker who will talk on "Highland Orchids of New Guinea", and Ken Russell whose subject is "Culture and Breeding of *Sarcochilus*".

Toowoomba is a city of over 80 000 situated on top of the Great Dividing Range, about 900 metres above sea level, just an hour and a half drive west of Brisbane.

For further information contact: The Secretary, Toowoomba Orchid Spectacular, P.O. Box 885, Toowoomba, Qld. 4350.

8th N.S.W. Regional Orchid Conference.

During the long weekend of 30th September to 2nd October, 1989, the Wagga Wagga Orchid Society will host the 8th N.S.W. Regional Orchid Conference. From a native orchid point of view, there are sure to be some excellent examples of well grown plants. Excursions are planned and one of these will be to Livingston State Forest to see native terrestrial orchids in their native habitat; another will be a visit to the local Botanic Gardens. Wagga Wagga has a population of about 50 000 and is known as the Garden City of the South West.

For further information write to: The Secretary, Wagga Wagga Orchid Society, P.O. Box 224, Kooringal, N.S.W. 2650.

Australasian Native Orchid Society (Victorian Group Inc.) Spring Show 1989.

On Saturday, 30 September (11.00 a.m. to 6.00 p.m.), and Sunday 1 October (9.00 a.m. to 4.00 p.m.), 1989, the ANOS Victorian Group Inc. will be conducting their Spring Show at the National Herbarium, Birdwood Avenue, South Yarra (Melway Map 58, A.1). The aims of the ANOS Victorian Group Inc. are, amongst others, to promote amongst members and the general public the appreciation, culture, propagation, and scientific knowledge of the native orchids of Australasia. The Spring Show has proven extremely popular in promoting the aims of this active group of people.

For further information contact: Helene Wild, Show Convenor, ANOS Victorian Group Inc., 56 Civic Parade, Seaholme, Vic. 3018.

1st Australasian Native Orchid Conference and Show, 1990.

From September 28 – 30, 1990, the 1st Australasian Native Orchid Conference and Show will be held at the University of Wollongong, NSW. The conference will be run by the Australasian Native Orchid Society and hosted by its Wollongong Group. It will cover such topics as the origins, distribution, propagation, history, hybridization, nomenclature, and conservation of Australasian orchids. A full and exciting social program has also been arranged. An Australasian Native Orchid Art Exhibition will provide an opportunity to view and buy paintings of Australasian orchids. Pre and Post conference tours are being organised.

For further information write to: The Conference Co-ordinator, Wollongong Uniadvice Ltd., The University of Wollongong, P.O. Box 1144, Wollongong, NSW 2500.

NOTES ON THE POLLINATION OF *DENDROBIUM KINGIANUM*

D.I. Smedley
25B Railway Street, Baulkham Hills, NSW 2153.

The pollination of *Dendrobium kingianum* by the introduced Honey Bee *Apis mellifera* has been recorded by Adams and Lawson (1987). Their observations were made on clones of the orchid cultivated in Melbourne, Victoria. Adams and Lawson (1988) have also described pollination of *D. kingianum* in the natural habitat by both *A. mellifera* and native *Trigona* bees. In this report, I record the pollination by *A. mellifera* of *D. kingianum* in Sydney, New South Wales.

Observations

On 25 August 1988, a warm, sunny and still morning, I removed three clones of *Dendrobium kingianum* from my general orchid collection and placed them side–by–side on a table in my backyard at Baulkham Hills. This action was in preparation for some crosses I wished to make using these plants. The three clones were 'Betty', 'Betty x Russell's Red' and a selfing of 'Corrigan's Red', all growing in 100 mm pots. These clones are similarly coloured; dark pink fading to white at the base of the petals and sepals with broad mauve and white labellums.

I left the plants for about 40 minutes and returned at 11 a.m. to observe a Honey Bee (*Apis mellifera* based on visual identification) enter a flower of 'Corrigan's Red' and emerge after about two seconds carrying the pollinia on its thorax. It then flew to a flower on 'Betty x Russell's Red', entered it and again emerged after two seconds carrying pollinia. I noted that these were different pollinia because of the slightly lighter shade of yellow to the first group.

The bee then returned to the 'Corrigan's Red' selfing, visited another flower, deposited the 'Betty x Russell's Red' pollinia and flew to the third clone, 'Betty' with a new lot of pollinia attached.

Here I was fortunate to directly observe the entry of the bee into the flower. It had some difficulty and the 'Corrigan's Red' pollinia was knocked off the thorax by the anther cap and fell away. The attachment of the 'Betty' pollinia to the bee was successful as it withdrew from the flower. The bee then flew around the group of plants for about 15 seconds, without landing, then departed the scene still carrying the 'Betty' pollinia.

Each flower known to have been visited by the bee was then inspected. The first flower on 'Corrigan's Red' had the anther cap dislodged but still attached to the column; the pollinia were removed. The flower on 'Betty x Russell's Red' had the anther cap similarly dislodged and the pollinia removed. The pollinia from 'Corrigan's Red' was lodged at the very top of this flower's stigmatic surface. Similar pollination was observed on the second 'Corrigan's Red' flower. As described above, the 'Betty' flower had only the pollinia removed.

After the departure of the bee, I surveyed all viable flowers on the plants (those aged or not yet fully open were not included) for evidence of attention. Table 1 records the results of this inspection of the 42 open flowers in the group.

Discussion

Of the viable flowers, 18 or 43% had been visited in the 40 minutes that the plants were together on the table. This indicates a very high degree of visitation even though there were only five examples of successful pollinia transfer. This level of visitation approximates that observed by Adams and Lawson (1987) who recorded disturbance in approximately one third of open flowers.

The reason for the observed lack of successful pollination of the 'Betty' clone was investigated. I determined that the aperture available to the bee on the 'Betty' flowers was proportionally smaller than that on the other clones under observation. The distance between the anther cap and the labellum on 'Betty' was 2.5 mm whereas on the other clones it was 3 mm. Furthermore, the side lobes of 'Betty's' labellum are relatively closer to the column than on the other clones. This would appear to account for the difficulty the bee had entering the 'Betty' flower and the lack of successful pollination evident for the other flowers on the plant (Table 1). These results support the view of Adams and Lawson (1987, 1988) that *A. mellifera* is a relatively inefficient pollinator of *D. kingianum*.

Table 1: Results of visits of the Honey Bee *Apis mellifera* to three cultivated clones of *D. kingianum*

D. kingianum clone	No. open flowers	No. flowers pollinated & pollinia removed	No. flowers pollinated & pollinia not removed	No. flowers pollinia removed only	No. flowers anther cap disturbed only
'Betty x Russell's Red'	21	1	2	3	5
'Corrigan's Red' selfing	11	2	—	2	—
'Betty'	10	—	—	3	—
Total	42	3	2	8	5

Conclusions

The observations reported here add credence to the view of Adams and Lawson (1987, 1988) that the Honey Bee *A. mellifera* is likely to be a significant pollinator of *D. kingianum* in its natural habitat. Like Adams and Lawson, I believe this is probably only the case where the smaller individuals amongst *A. mellifera* visit the larger clones of *D. kingianum.* The lack of success pollinating 'Betty' appears to confirm this supposition.

References

Adams, P.B. and Lawson, S.D. 1987. Pollination of *Dendrobium kingianum* Bidw. by the Honey Bee (*Apis mellifera*) *The Orchadian* 8:250-251.

Adams, P.B. and Lawson, S.D. 1988. Multiple bee pollinators of *Dendrobium kingianum* Bidw. in the natural habitat. *The Orchadian* 9: 103-107.

POT CULTURE FOR *DENDROBIUM CANALICULATUM*?

Erhard Husted

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Some time ago, I attended an ANOS Sydney Group Show at Castle Hill. Amongst the exhibits was a *Dendrobium canaliculatum* that appeared to be growing in straight small pea sized gravel. The plant had rather large plump pseudobulbs and numerous flower spikes. I felt that the pot culture was aesthetically pleasing and to my mind was more attractive than original hosts, hardwood plants, cork, etc. Pots would also be a lot easier to bench.

Being aware that pea gravel and bark are usually blended together, I was a bit concerned at straight pea gravel being the only medium. I therefore tried a pea gravel and bark mix plus a straight pea gravel. After several waterings, my concern about the straight pea gravel was solved. The lighter bark washed out over the top of the pot leaving the heavier pea gravel in the pot, thus giving the appearance of straight pea gravel.

After several months and an ever-increasing worry that both the mixes were not beneficial to the plants, I emptied out the contents of both pots to see what was going on. Roots had started to grow but were not romping away. What to do? Pot culture was my aim.

How about trying wine corks? Memories came back to me; orchid roots chase the sugar, or was it that they chased the yeast. I am still not sure if it is sugar or yeast that is the attraction.

A few plants were selected to try with wine corks, including the depotted plants. Red and white corks were selected so that I had four pots containing: (1) Pot A, 100% red; (2) Pot B, 100% white; (3) Pot C, 50% each red and white; and (4) Pot D, 50% each red and white with pea gravel.

Plants were tied to a bamboo stake and the corks were placed in and around the pot so that the stake was held firmly in place. Roots soon ran riot, climbing through and around the corks in gay abandon, so much so that the pots can be lifted by the plant without any fear of the pot and plants parting company.

The plant in the pot with the pea gravel did not do as well as those in corks only. I firmly believe that the pea gravel holds too much moisture. This pot now contains wine corks only and the plant is starting to improve with new roots starting to take an interest in the corks.

I have been rewarded with large plump healthy pseudobulbs and numerous flower spikes, far more than I had when the plans were mounted. I am now experimenting with other plants.

No special attention was given to these plants by way of fertilizer nor insecticides. I am pleased with the results; perhaps the plants are happily intoxicated.

WHO DREW *CALOCHILUS CAMPESTRIS*?

Ian St George
45 Cargill Street, Dunedin, New Zealand.

In Curtis's Botanical Magazine of 1832 there is a very good lithograph (no.3187) of *Calochilus campestris,* the first published illustration of this orchid (Fig. 1). It bears the inscription "Dr. J.Scott delt Swan sc" (Dr. J. Scott drew it, Swan engraved it).

The orchid was found in Tasmania; Sir W.J. Hooker wrote in the accompanying paper:

> "Mr Brown, its original discoverer, found it not only about Port Jackson, but in the tropical parts of New Holland and Mr. Allan Cunningham gathered it on stony hills near Bathurst. Our drawing was made from the living plant in Van Dieman's Land, by Dr. John Scott, who detected it in low, shaded grounds; but who observes, that it is rarely met with in that island".

The original drawing at Kew is labelled "Dr. J. Scott del", and was presented to Kew by the Royal Horticultural Society in 1923. The doctor was in fact James (not John) Scott, who became colonial surgeon at Hobart in 1820. His journal is in the possession of the Royal Society of Tasmania, and gives a vivid account of early medical practice there (Crowther, 1954). He was a keen natural historian, and collected specimens and wrote articles on his work (Anon, 1967). The *Hobart Town Courier* proudly told its readers:

> "We are pleased to see that one of the numerous nondescript but beautiful plants of this Island, recently collected by our Colonial Surgeon, Dr. Scott, enriches the last number of Curtis' splendidly embellished Botanical Magazine."

Hooker's difficulty with the name can hardly have been helped by a letter to him from R.C. Gunn in 1835:

> "In your letter to me and elsewhere you address Mr. Thomas Scott – as Dr. Thos. Scott. – He is not a Doctor but a merchant in Launceston. – I would not make this remark to you but there is a Dr. James Scott who will get the credit of any he may have sent to you — and I see Backhouse in his "Index Plantarum" (which I sent you in one of the boxes), also blunders and gives a Mr. J.W. Scott credit for having sent you those sent by our mutual and worthy friend Mr. Thomas Scott, Merchant. – Mr. J.W. Scott is an ignorant man from Hobart Town but an

indefatigable collector of seeds" (Burns and Skemp, 1961).

Hooker was probably even wrong about the artist of *Calochilus campestris*, for the drawing is almost certainly done, not by Dr. Scott, but by William Buelow Gould (ca. 1805-1853), who worked for the doctor and whose known botanical drawings are in the same style. As far as I can gather from the literature, Scott did not draw.

Gould was born with the surname Holland, in Liverpool, and was trained as an artist, probably by William Mulready R.A. He may have worked at Spodes, flower painting for fine china, and for Rudolph Ackerman in the Strand, in London.

He came to Tasmania as a convict; the diary of the First Officer of the *Asia* which brought him there wrote: "This poor wretch is another example of the baneful effects produced by gambling". His charge reads that he had, "with force of arms stolen one coat", presumably to finance his habit, and the sentence was "seven years beyond the seas". He arrived with 200 other convicts on the *Asia* in 1827. He painted portraits of the officers on the voyage out, but was set to "public works" on his arrival.

Within two months, Gould was charged with drunkenness, and this was to be the pattern of his existence over the next few years – petty thefts and drinking charges. In 1829, he was assigned to Dr. Scott, but was later returned to barracks for drunkenness; in fact over the two years with Dr. Scott he spent time in the cells on bread and water, was lashed, worked the treadmill, did hard labour, and suffered in the hulk chain gang.

In 1832, he sailed for Macquarie Harbour where, as a servant of a Dr. de Little, he was employed at drawing. His artistic record of the area is a valuable one, some of his best work being scenes, shellfish, fish, native birds and flowers. He was freed in 1835 and took up coach painting in Launceston. When he painted the set for a local play, he was billed as "Mr Gould, an eminent Colonial Artist". In 1836 he married, and seems to have settled down, but by 1845 he was again in trouble, jailed for petty theft. He served two years, and lived only six more, drying of "natural causes" in 1853 at age 48 (Mead, 1958; Burns and Skemp, 1961).

After an exemplary life, Dr. James Scott had died sixteen years earlier at 47.

During his time with Scott, Gould executed some of his finest drawings, and some of the flower studies are quite exquisite. One hundred and seventy-seven of these were purchased in 1958 by the Queen Victoria Museum and Art Gallery at Launceston, and those I have seen are strikingly similar in style to the study of *Calochilus campestris* which was sent to Hooker by Scott, attributed to Scott by Hooker, engraved by Swan and published in Curtis's magazine in 1832.

The apologists for alcoholism, drug addiction, gambling, madness and disease among artists would claim that only from such suffering springs the urge to creativity. Perhaps it is sometimes so. More often, one suspects, the affliction obstructs the effort: one wonders what Gould could have done had he not suffered from his addictions.

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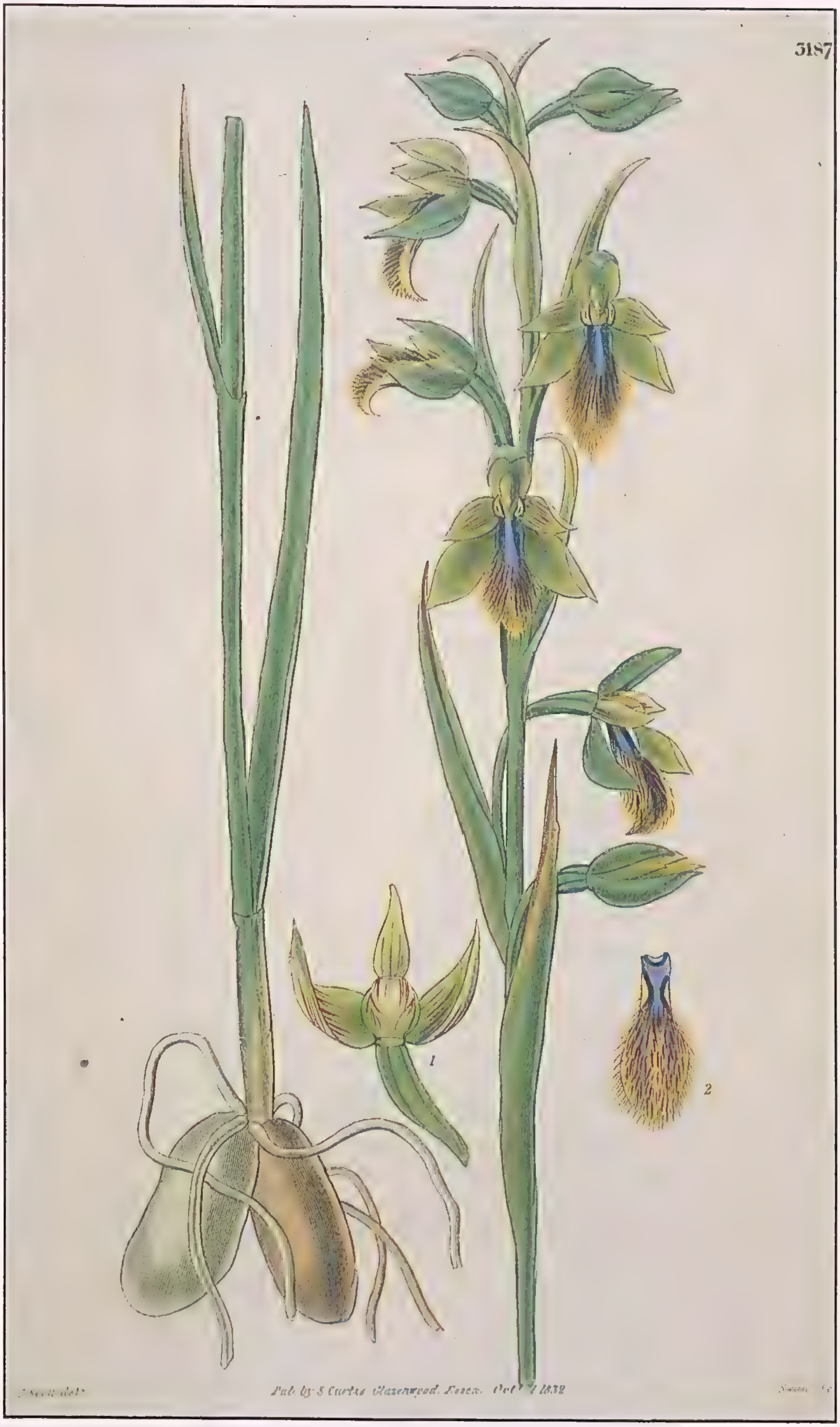
Fig. 1 (Opposite page). *Calochilus campestris.* Drawing attributed to James Scott, but probably by William Buelow Gould. Coloured lithograph From *Curtis's Botanical Magazine*, 1832. No. 3187.


3187
1
2
Pub. by S. Curtis Glazenwood, Essex. Oct. 1 1832

AUSTRALIAN NATIVE ORCHID HYBRIDS

(New registrations by the R.H.S. from lists in *The Orchid Review*, January – April, 1989)

NAME	PARENTAGE	REGISTERED BY
Dendrobium		
Amy Moloney	Gloucester Sands x *johannis*	J. Jarvis
Aussie Ruby	Aussie Ira x Hilda Poxon	P. Spence's
Aussie Victory	Ellen x Sunglow	P. Spence's
Aussie Wow	Sunglow x Wonga	P. Spence's
Betty Conroy	Ella Victoria Leaney x Kingrose	K. Conroy (O/U)
Bicentennial Blush	Gillian Leaney x Kim	D. Mitten
Bicentennial Rose	*kingianum* x Gillian Leaney	D. Mitten
Castle	Specio-kingianum x Gillian Leaney	W. Skillicorn
Elegant Queen	Suzanne x *speciosum*	W. Upton
Gillieston	Ku-Ring-Gai x Gillian Leaney	W. Skillicorn
Golden Dorn	Eureka x Nunkumbil	W. Skillicorn
Goldilocks	Eureka x Jamie Upton	W. Upton
Hewitt Star	Allyn Star x Graham Hewitt	D. Cannon
Ivory	Star Delight x *speciosum*	W. Skillicorn
Kingstar	*kingianum* x Star Delight	W. Skillicorn
Merrymaker	*tetragonum* x Ku-Ring-Gai	R. & D. Sheen
Morning Light	*tetragonum* x Wonga	W. Upton
Red Flush	Colin x Red Baron	W. Upton
Tasha Sakaguchi[1]	White Gem x *d'albertisii*	D. Bartholomew
Valmai	Kim x *falcorostrum*	A. Peck
Yellow Glow	Emma x *speciosum*	W. Upton
Yondi Brolga	*kingianum* x Peach Glow	S. Batchelor
Yondi Glow	Hilda Poxon x Peach Glow	S. Batchelor
Sarcochilus		
Emily	Mavis x *australis*	W. Upton
Kate	*roseus* x Heidi	J. & M. Lattimore
Ruby	*ceciliae* x Pinkhart	W. Skillicorn
Verolica	*falcatus* x *fitzgeraldii*	C. Wuth

The registration indicated by the superscripted numeral will be listed as *Den.* Tasha Sakaguchi = White Gem x *antennatum* in *A Checklist of Australian Native Orchids* published by ANOS.

SOME LITTLE KNOWN VICTORIAN ORCHID TAXA – PART 1

Jeff Jeanes
25 Sasses Avenue, Bayswater, Victoria 3153

Over the past ten years I have travelled extensively throughout Victoria and eastern New South Wales seeking out orchids, particularly the rarer species. Most of the plants I have found are well known taxa and present no problems of classification, having been described and illustrated in many reputable publications (Rupp, 1969; Nicholls, 1969; Black, 1986; Bates, 1987; Jones, 1988). Others present problems as they are obviously not widely known, even in professional circles, and finding information about them can be most frustrating. It is some of this latter group that I wish to discuss and although I will confine myself to plants I have seen in Victoria, many will obviously extend into neighboring states and may present the same problems there. I am not always sure that my interpretations of these taxa are correct and would welcome comments from readers who are more familiar with them.

Caladenia alata R. Br. (Fig. 1)

On a recent trip to East Gippsland (October, 1988), I found a tiny orchid which was completely new to me. It was obviously closely related to *Caladenia carnea*, but differed from that species in a few respects including: plant with a single white flower with distinctive red bands on labellum side lobes and column; labellum mid-lobe yellow tipped and with two yellow glands at base; and very short floral segments up to 7 mm in length. The single colony of about half a dozen plants was found on hard packed clay soil in open eucalypt forest within 20 metres of a creek. Also growing nearby were *Glossodia minor, Lyperanthus suaveolens, Thelymitra carnea, Thelymitra flexuosa* and *Caladenia praecox* (The latter was a tentative identification).

When I got home, I opened a copy of *Native Orchids of Australia* (Jones, 1988) and found the description of *Caladenia alata* fitted my new find quite well. This species has previously been known in Australia as *Caladenia carnea* var. *exigua* and as *Caladenia exigua* in New Zealand. It has probably been seen many times in this state but has generally been dismissed as either *Caladenia carnea* or perhaps even *Caladenia aurantiaca* which it superficially resembles. Although it is a fairly distinctive taxon, its distribution and conservation status, at least in Victoria, appears to be largely unknown.

Pterostylis xerophila M. Clements (Fig. 2)

October 8th, 1987, found me in the western section of Wyperfeld National Park at a place known as Rudd's Rocks. This magnificent wilderness with its sand heaths, mallee scrub and unusual outcrops of sandstone rock is most impressive. I was here because I had read that the recently named *Pterostylis xerophila* had been seen in the area. Systematically, I inspected the gravelly sandstone surface amid the dominant broom-bush (*Melaleuca uncinata*) vegetation in the hope of finding this rarity. There was evidence of *Caladenia carnea, Caladenia filamentosa* and *Pterostylis mutica* around but these had all finished flowering. Five hours later I found my first flowering orchid and it was a greenhood of the "Rufa" group. Closer inspection revealed a single flower and two unopened buds, and that it was a species with which I was totally unfamiliar. A quick comparison with a description and line drawing of *Pterostylis xerophila* showed it to most likely be this species although the flower colour was different, the specimen being green, and the description stating brown. An intensive search nearby disclosed a further two plants, one chewed off just above the withered rosette and the other with a single flower and a bud yet to open.

Pterostylis xerophila (formerly *Pterostylis sp.* Murray Bridge) is similar to *Pterostylis boormanii*, differing in its less deflexed flowers, less concave and nearly glabrous lateral sepals and the more widely opening galea. Many, if not all, of the old records of *Pterostylis boormanii* and *Pterostylis hamata* for the Victorian mallee probably refer to this species. It has been known to occur in Wyperfeld National Park for many years, the original colony growing on the summit of a tall sand dune amongst mosses under a thicket of tea-tree (*Leptospermum coriaceum*). This colony has been badly damaged by rabbits and has declined in numbers and not produced flowers for a number of years. It is also

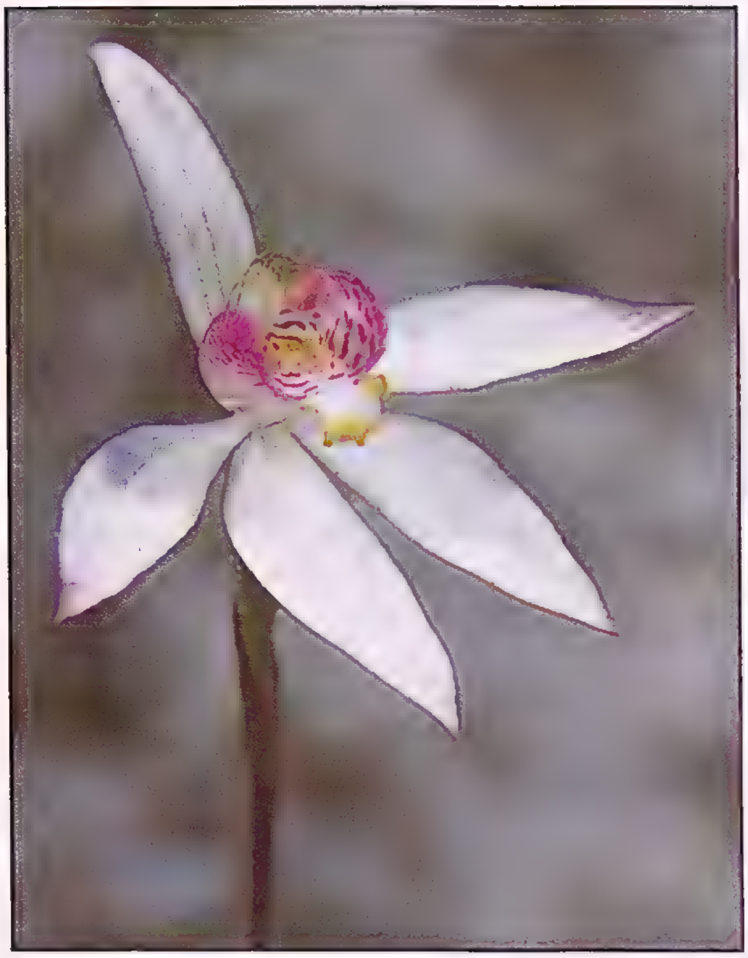


Fig. 1. *Caladenia alata* R. Br.

All photography by J. Jeanes.

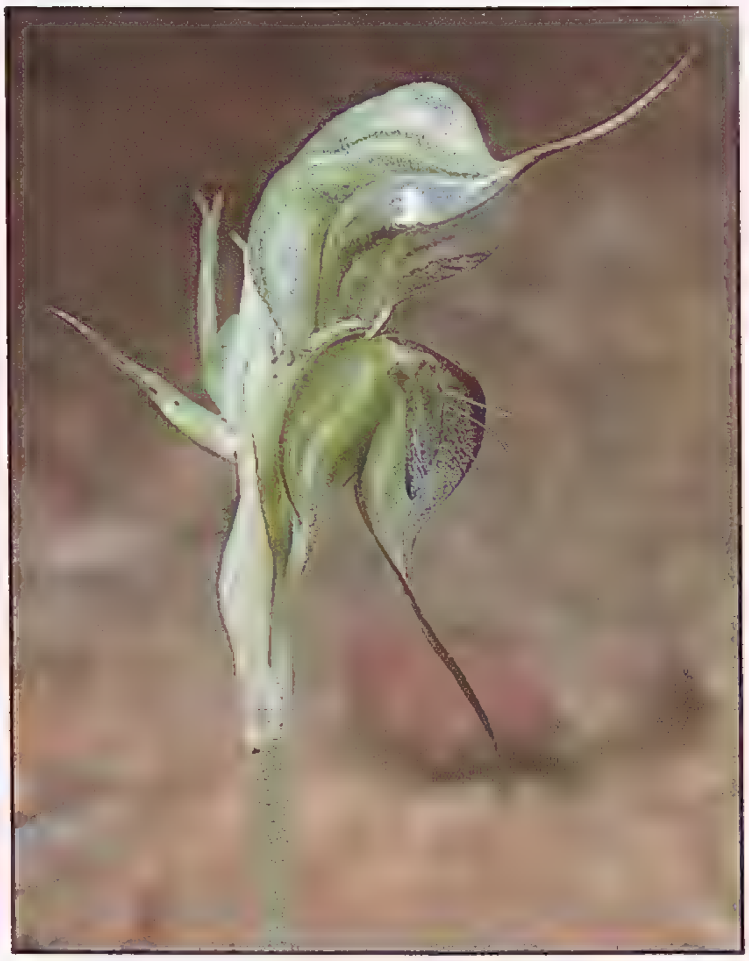


Fig. 2. *Pterostylis xerophila* M. Clements

known to occur in the Big Desert and Sunset Country in association with sandstone outcrops and, although quite rare, is probably secure in this state.

Calochilus gracillimus Rupp (Fig. 3)

I have known of a late flowering *Calochilus* species in the Cobberas/Tingaringy National Park for some years now but have only recently seen the flowers open. The plants are tall and slender and flowering generally commences about mid-January, at which time the co-extensive *Calochilus robertsonii* is well and truly in pod or is already shedding seed. This reproductive isolation suggests that two separate species may be involved, although the flowers are strikingly similar. The only noticeable differences are the paler and more sparse hairs on the labellum of the late flowering species. I have recently been told of the same species occurring in two other Victorian localities, Enfield (Mrs Bon Strange, pers. comm.) and Christmas Hills (Mr Dean Rouse, pers. comm.) and I believe I saw it some years back at Buladelah in northern New South Wales.

Fresh flowering specimens of the plants from the Cobberas/Tingaringy National Park have recently been sent to the Canberra Botanical Gardens and have been positively identified as *Calochilus gracillimus*. This is the first time that this species has been recorded south of the Blue Mountains and is thus a new record for Victoria. The range of the species has been extended so appreciably that it may possibly occur in the open forests of South Australia and Tasmania. In the sub-alpine regions of East Gippsland, it is locally common and has probably been overlooked in the past due to its similarity to *Calochilus robertsonii*. This may also be the case in other regions of Victoria and *Calochilus gracillimus* may be reasonably widespread and abundant in this state.

Distribution

The distribution maps for these species in Victoria are shown in Fig. 4.

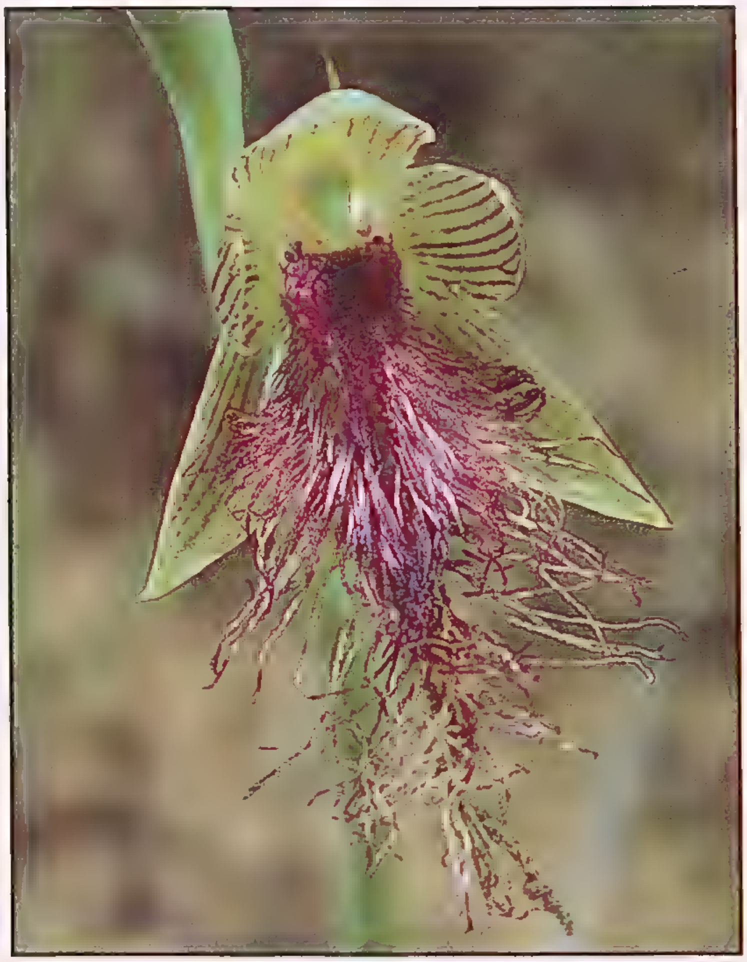


Fig. 3. *Calochilus gracillimus* Rupp

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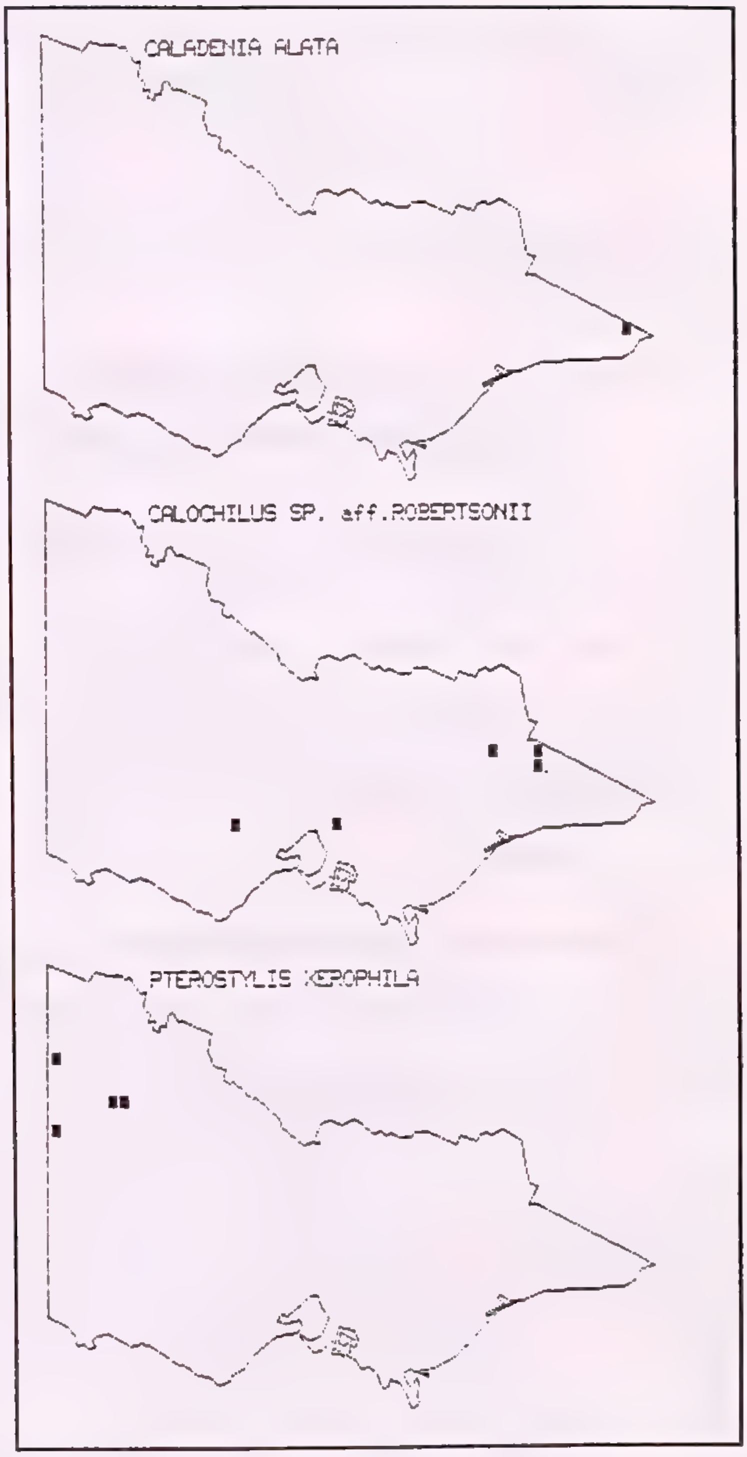

Fig. 4. Distribution maps of *Caladenia alata, Pterostylis xerophila,* and *Calochilus gracillimus* in Victoria.

Explanation of Distribution Maps

The mapping system used is that devised by the National Herbarium of Melbourne (Churchill and de Corona 1972). In this system the state of Victoria is divided into small "rectangles" covering an area of 10 minutes of latitude by 10 minutes of longitude. A "rectangle" has been filled if I have seen, or have heard reliable accounts of, the species occurring within its boundaries.

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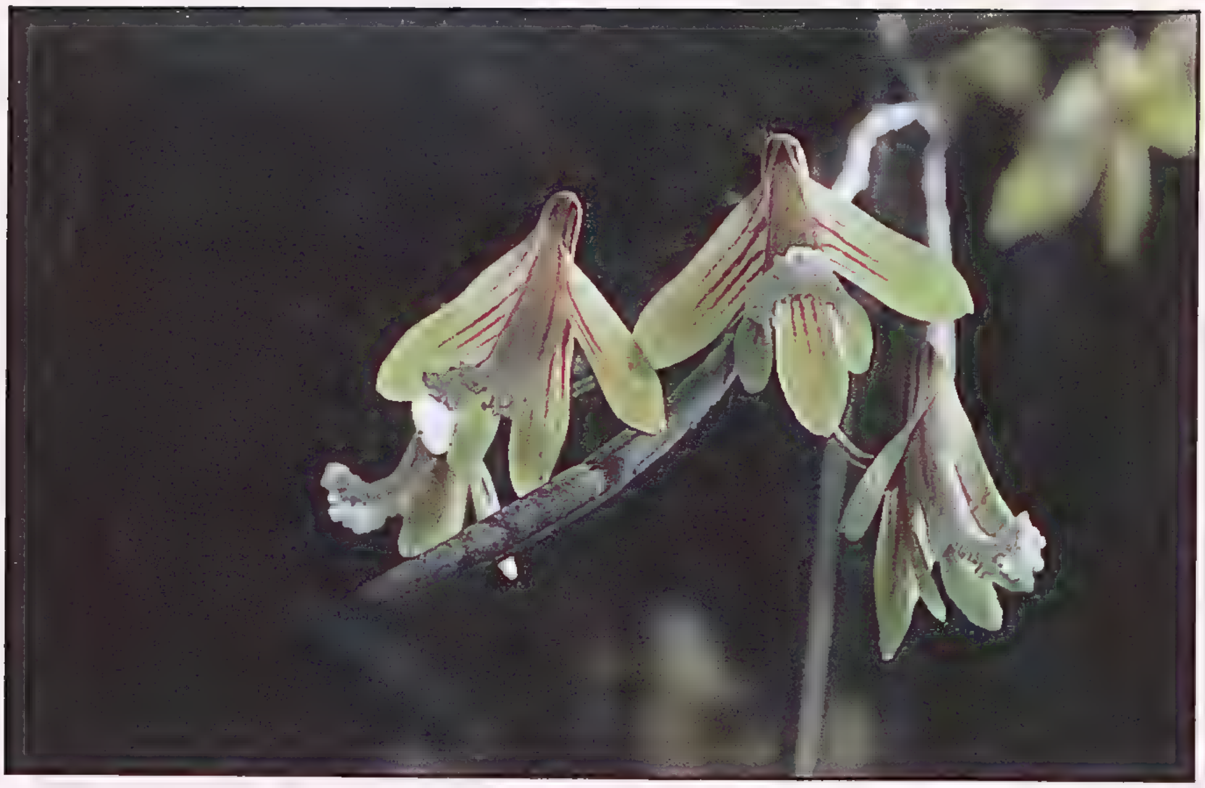
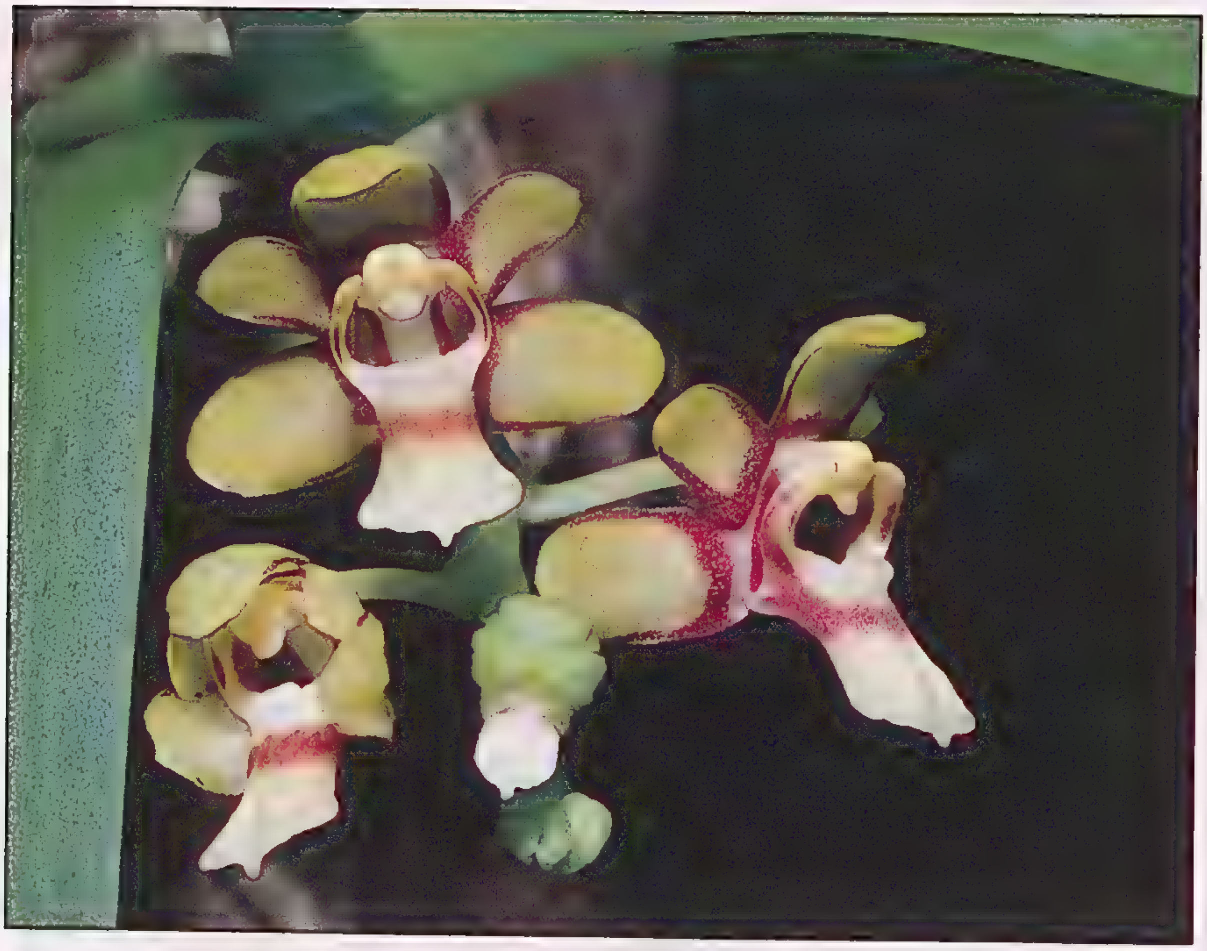


Dendrobium bowmanii This autumn flowering species occurs as scattered population from north-eastern NSW to far North Queensland. (See page 170)



Pteroceras hirticalcar This beautiful orchid is restricted to the McIlwraith Range in central eastern Cape York Pennisula. Photos by M. Webb. (See page 172)

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The Orchadian

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Phaius tankervilleae (Banks) Bl.

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Date distributed: 6th NOVEMBER, 1989

EDITORIAL

Farewell Bill Murdoch

Our foundation President, W.H. (Bill) Murdoch, passed away peacefully in the early morning of July 24th, 1989. *The Orchadian* joins with Bill's many friends in remembering his achievements and extends to his family our condolences.

Bill Murdoch was born in South Gippsland, Victoria, in the farming district of Poowong, on 17 September 1895. The family moved firstly to the new coalfields at Outtrim in 1898, then to Jumbunna and finally Kurri Kurri, on the Maitland coalfields in NSW.

Bill Murdoch was an ANZAC. He commenced his National Service in July, 1911, and was transferred to the militia as Colour Sergeant. When World War I broke out in 1914, Bill firstly saw local service, then enlisted in the AIF. He saw overseas service firstly at Gallipoli, and later in France at the Somme and Flanders.

After discharge from the army, Bill returned to Kurri Kurri where he set up as a greengrocer. After a stint at Griffith where he grew wine grapes and then worked in the interest of Soldier Settlers, he returned to the Hunter River valley to take up dry-land farming at Buttai. With the advent of World War II, Bill became second in command of the 19th Training Battalion, and later as Assistant Provost Marshal of the Second Army with the rank of Lieutenant Colonel. At the end of the war, Bill purchased land at Coal Point on Lake Macquarie and built his home there.

It was at luncheons at the Masonic Club, Sydney, in January and February, 1963, with Walter Upton and Jim Scott, that Bill Murdoch, then 68 years young, hatched the plans that led to the formation of the Australasian Native Orchid Society. At the inaugural meeting of ANOS on 6 July, 1963, Bill Murdoch was elected President, a position he held for the next three years. Bill Murdoch was a tireless worker and advocate for Australasian native orchids. At his own expense, he toured throughout Australia speaking on native orchids and encouraging others to form local groups of ANOS. After his three years as President, he then served a further three years as Vice-President.

Many people knew Bill Murdoch. His gruff good fellowship was legendary. We will all miss him but we have ANOS as his legacy to us. Let us nurture his goals for Australasian native orchids well.

Soon after Bill Murdoch's funeral, George Hillman sent me a poem that had been written and read at Bill's funeral by his grandson, Andrew Murdoch. I thank Andrew for giving permission to print it here and George for forwarding it to me. The poem says much that needs to be said about Bill Murdoch.

Noel J. Grundon

Old Friend Bill

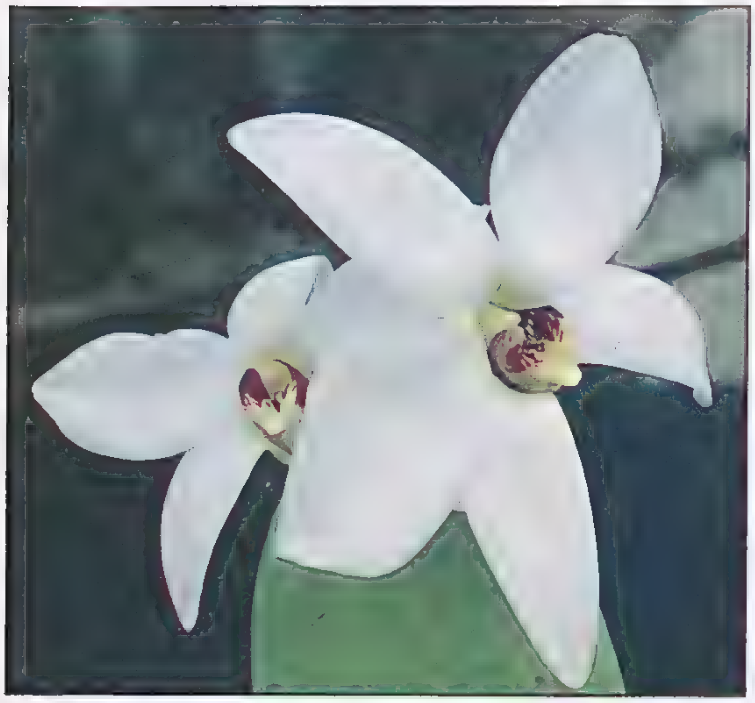
An old man in a wheelchair;
He doesn't seem to have much hair.
A toothy grin when memories
of yesteryear return to him.
I see the swollen feet again.
The shrunken man was never thin.
An appetite for all things sweet,
He loved his pudding, such a treat!

From Kurri school to blacksmith's hand,
Fighting man returning to the land.
Orchid growing, plant nursery,
Vegetables and gammy knee.
Patriarch for three generations.
Endless hours of conversations.
Memories of dearest Kate,
His sweetheart, who had gone of late.

Some say he had enemies.
He didn't often try to please.
And some know he felt much pain,
Within his body and in his mind.
The pain from serving king and country,
On battlefields far away.
The pain from seeing digger mates
Shot down; never to return again.

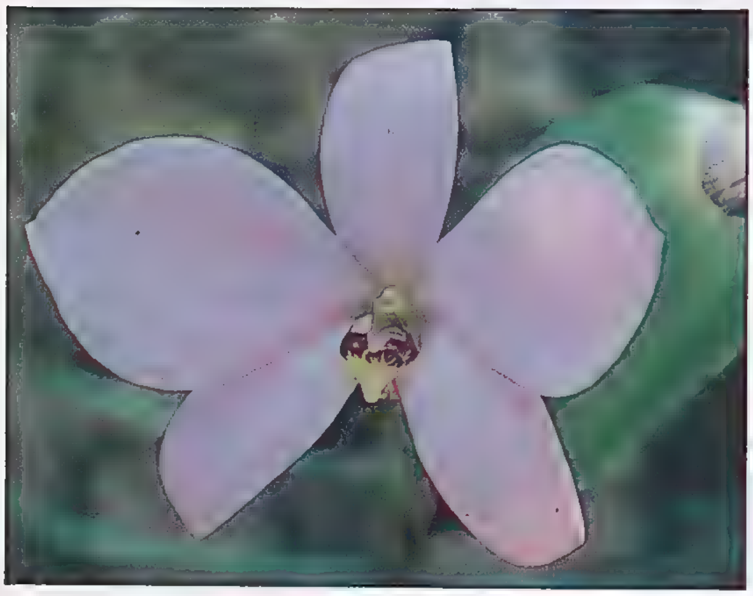
He was a friend for those who had
The time to sit and hear a yarn.
He was inclined to give advice
To anyone who came along.
A stubborn man, with strength of heart,
Who gave it his best from the start.
We won't forget the man called Bill
For those who knew you, we love you still.

Andrew Murdoch



Opposite Page

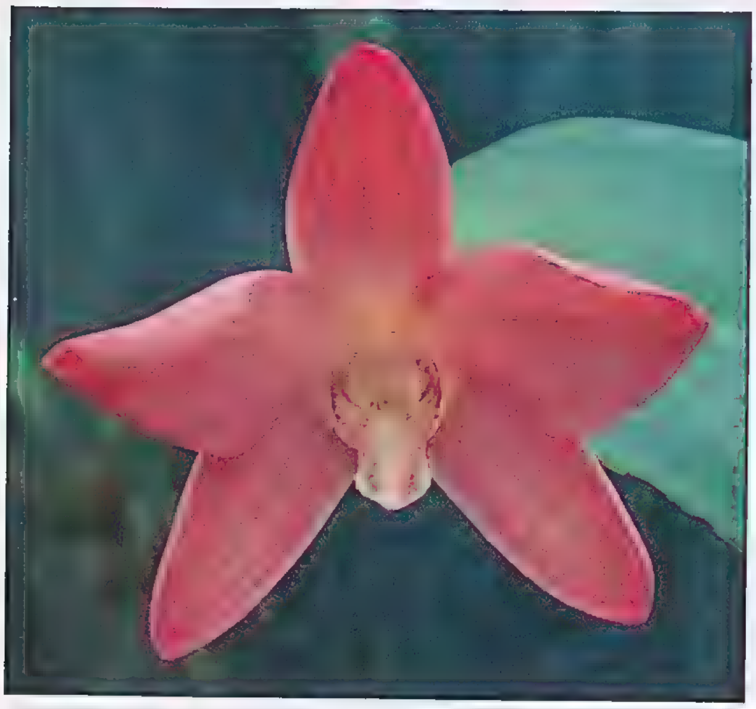
Top left: ***Coelogyne fragrans*** Schltr.
Photo by P. Spence.
Top right: ***Glomera aurea*** Schltr.
Bottom left: ***Oberonia arcuata*** Schltr.
Bottom right: ***Liparis werneri*** Schltr.
Photos by Mrs A. Millar (See page 195).

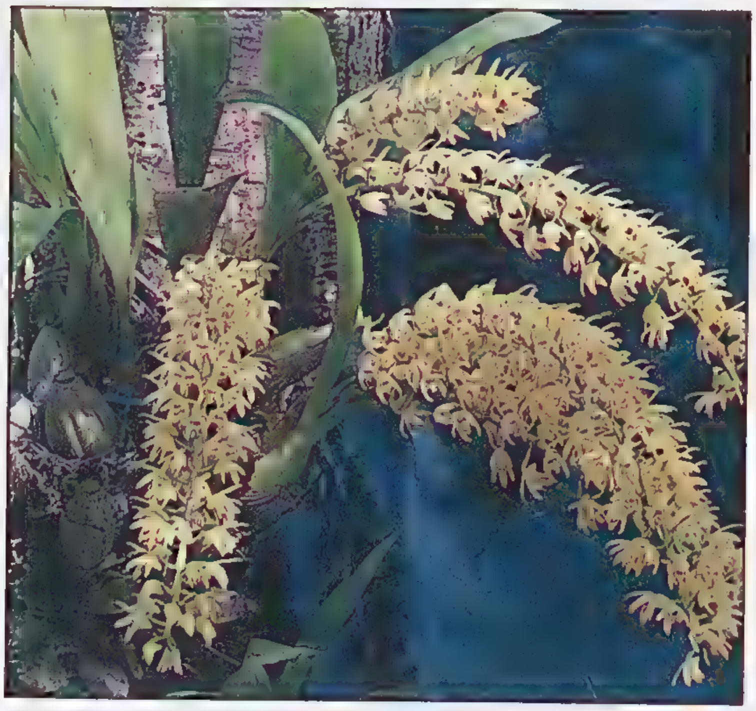


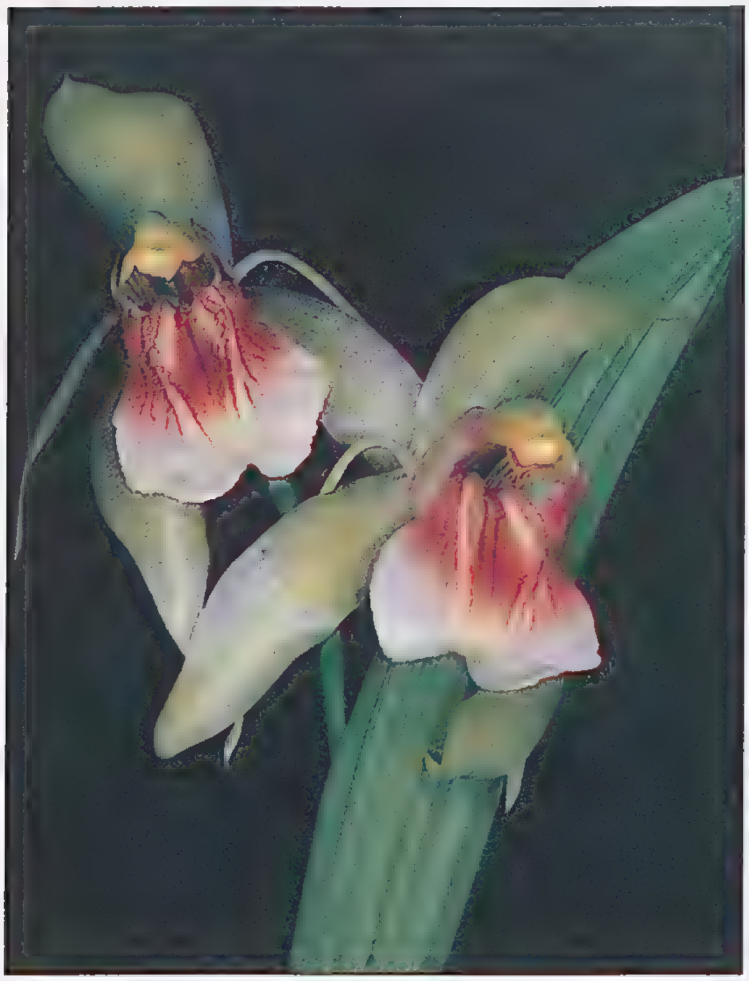
This Page

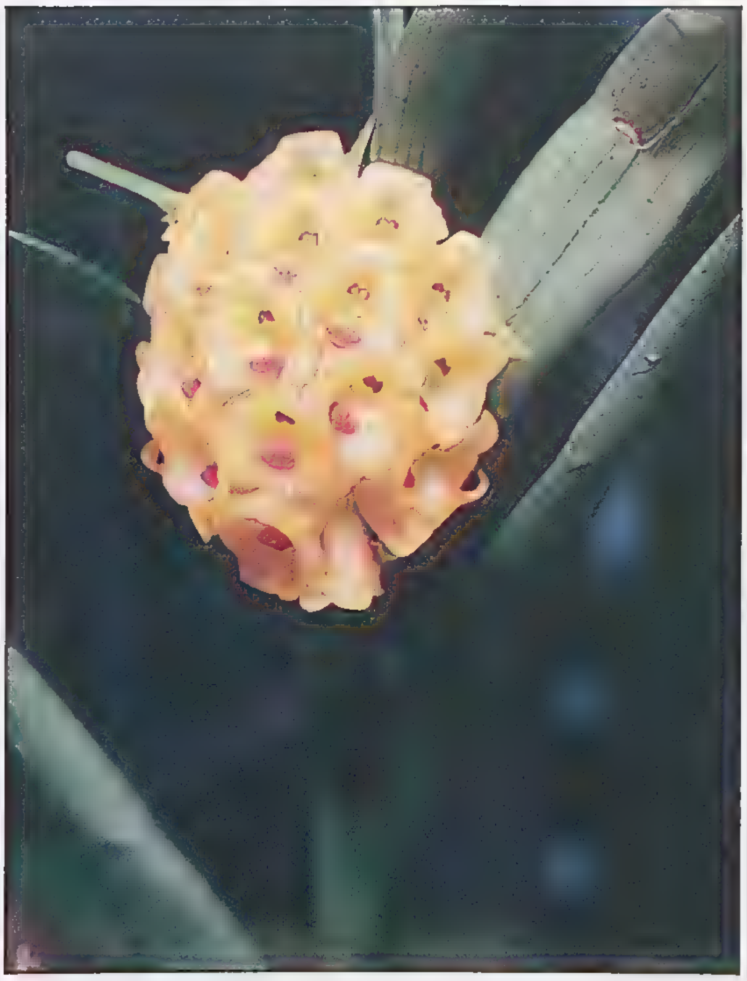
Top left: ***Diplocaulobium regale*** Schltr. - white form
Centre left: ***D. regale*** Schltr. - pink form
Bottom left: ***D. regale*** Schltr. - An unusual apricot form.
Below: ***Eria micholitzii*** Kraenzlin
Photos by T. Reeve (See page 194).

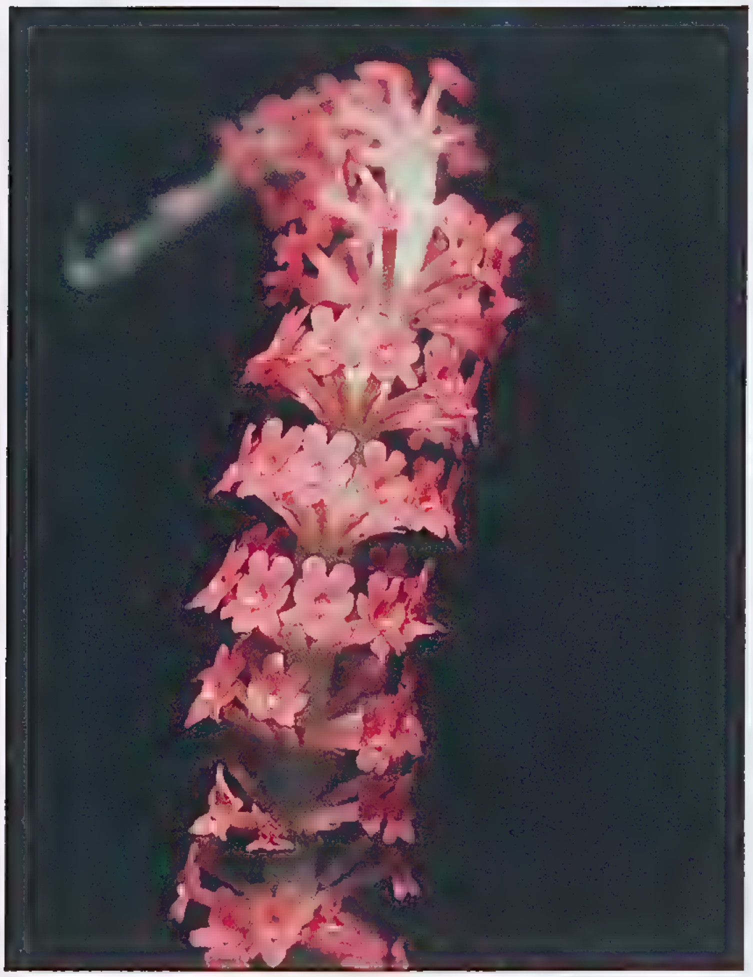
These colour pictures were made possible by a grant from the Australian Orchid Foundation.

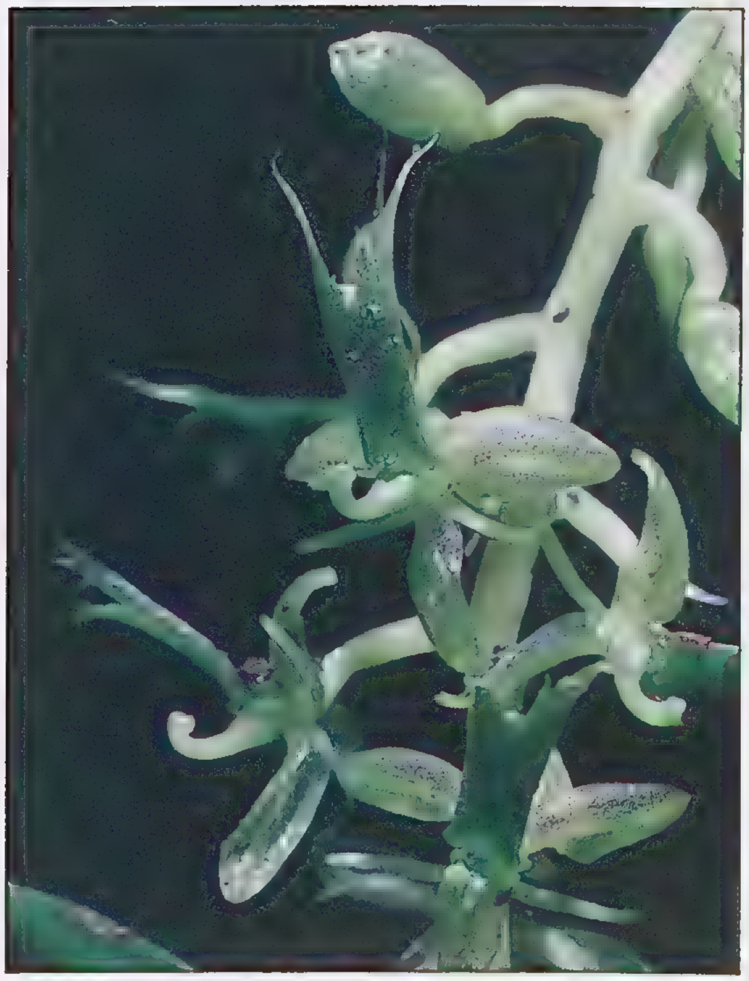












ORCHIDS OF MOUNT GAHAVISUKA - PART THREE: THE OTHER EPIPHYTES

Norman E G Cruttwell
'Calanthe', PO Box 961, Goroka, EHP, Papua New Guinea.

In this third article of a series of four articles on Papua New Guinea highland orchids, I will discuss the other epiphytic orchids which occur in Mt Gahavisuka Provincial Park, near Goroka, Eastern Highlands Province. Why Epiphytes? As one approaches the equator, a larger proportion of the plants occur as epiphytes, especially in the rainforests. Although a few epiphytes occur even in temperate zones where the rainfall is very high, the species are usually confined to the mosses, lichens and ferns. However in the tropical rainforests, and even on isolated trees in humid tropical areas, epiphytes are abundant and a conspicuous feature of the landscape. Some of them are plants which also grow on the ground, but many occur as epiphytes only. These include the majority of orchids, some gingers, ant-plants, and even rhododendrons, as well as innumerable mosses, ferns and lycopods.

The reason for adopting this aerial habitat is first and foremost to obtain more light; the floor of a multi-storied forest may be very dark. Another reason is that, as epiphytes, they escape the competition from other plants growing on the floor of the forest. Many of them, especially most *Dendrobium* species, appreciate the free air movement and the swirling mists which sweep almost daily over the canopy. These factors have to be taken into account in their cultivation.

It is often asked how they obtain sufficient water and nutrients in such a situation. The answer of course is the heavy rainfall, high humidity and the accumulation of humus from decaying epiphytes, tree bark, and insect and animal excreta on the trunk or limbs above them. But there are periods of drought and starvation, and many epiphytes have developed succulent pseudobulbs and spongy roots to assist them in surviving these periods. Some open their stomates only at night to cut down loss of water and fix their carbon by the crassulacean acid metabolic pathway (CAM).

In any case, the epiphytes are remarkably successful in the highlands of PNG where the rainforests are reasonably intact, but are in great danger where the forests are being indiscriminately felled.

The *Dendrobium* Allies

Some of the close allies of *Dendrobium* were included by previous authors in this genus, but are now regarded as separate. One of the most widespread of these is *Diplocaulobium*. Some have a creeping habit and readily form mats, such as the ubiquitous *Diplocaulobium chrysotropis* which forms large patches on trunks of trees. A mass of delicate starry white flowers erupt periodically from these patches; the petals and sepals have yellow tips while the labellum has yellow and purple markings. The display lasts for a few days only. Many *Diplocaulobium* are of the pin-cushion type, having pseudobulbs which are bulbous at the base only and formed into long wand-like stems with a single leaf at the top, from the base of which the flowers emerge. The flowers are usually spidery in form, white in colour with gold tips to the sepals and petals. Alas, they are one-day-wonders or even half-day-wonders and turn a deep pink as they die and close. One common species, *Diplocaulobium iboense*, has very long golden 'stems' which the local people use for weaving bright yellow armlets. It is often planted as a decoration on the tops of village round-houses.

But the king of the genus, as its name implies, is *Diplocaulobium regale* which has flowers with broad segments of a bright cherry red colour. Another species, *Diplocaulobium auricolor*, has golden yellow flowers, while *Diplocaulobium centrale* has pure white flowers which fade to pink. Unfortunately, they are all one-day-wonders.

Another *Dendrobium* ally is *Eria*. This is a large and little known genus of orchids, some of which are hardly worth looking at while others are showy and attractive when in flower. However, the flowers do not last very long. Perhaps the best is *Eria javanica* (probably synonymous with *Eria micholitzii*; T M Reeve, pers. comm.) which has long sprays of starry creamy white flowers which open together but last only a few days. It has the appearance of a pendulous *Coelogyne*. Another, *Eria imitans*, is reminiscent of *Coelogyne beccarii*. An as yet undescribed species in our Park has narrow leaves and many delicate sprays of creamy white flowers which have labellums flecked with purple. Other *Eria* are more like a Latouria *Dendrobium* in growth, but the copious sprays of small white, yellow or pink flowers are produced out of the side of the pseudobulb. Yet another group, of which *Eria velutina* is the type, has pendulous stems with brown velvet-like material on leaves and flowers. *Eria* is a genus which is not showy, but contains some delightful orchids.

Another member of the *Dendrobium* allies is *Cadetia*, the members of which are small tufted orchids which produce a single white flower from the base of the single leaf on each stem. They usually grow in colonies which often delightfully decorate treefern trunks. For those who like miniature orchids, *Cadetia* are worth growing. One of the taller ones in our Park is the aptly named *Cadetia ceratostyloides*.

The *Coelogyne*

Following Schlechter's classification, I will move back from the *Dendrobiinae* to the *Coelogyninae*. These come earlier in his system and are the first of the epiphytic groups. Everyone knows *Coelogyne* as many of them are in cultivation. I only know of seven in PNG but they are all delightful plants. The two commonest are *Coelogyne fragrans* and *Coelogyne asperata*. Both are large plants and all the flowers on the spray open together. Both can be epiphytic, lithophytic or terrestrial, although *Coelogyne asperata* rather prefers the latter but only on steep slopes. Both are slightly scented. *Coelogyne asperata* has much longer arching sprays, but *Coelogyne fragrans* has larger flowers. The colour is similar in both species; cream sepals and petals with deep orange to brown in the centre of the labellum. Both are beautiful species and easy to grow.

Smaller but somewhat similar is *Coelogyne truncicola* from lower montane forest. The long spiked *Coelogyne veitchii* is only from lowland areas. But there is another mountain species called *Coelogyne beccarii* whose rather large flowers open in succession. This habit is shared by the spectacular and rare *Coelogyne macdonaldii* which occurs only on Bougainville Island. When I first heard of this species, I was told that it had flowers seven inches across, but I think this must be an exaggeration. I found it myself on Mt Balbi in 1986, and the only rather faded flower I saw was about five inches across. However, this was spectacular enough, especially when added to its deep red and white speckled, labellum.

In this group are the two 'Chain Orchids', *Dendrochilum* and *Pholidota*. *Dendrochilum longifolium* is common at Mt Gahavisuka and has a delicate charm all of its own. *Pholidota pallida* is lowland, but we have one small species, probably *Pholidota carnea*, in the Park.

The Liparids

These are nearly all terrestrial, though a few species of *Liparis* are epiphytic, notably *Liparis werneri* which has pendulous sprays of delicate green translucent flowers with a forked labellum, like a snake's tongue. It is common in the Park. The one true epiphyte in this group is the charming little *Oberonia* with its equitant leaves and long tails of innumerable microscopic orange to red flowers. Well named after the king of the fairies.

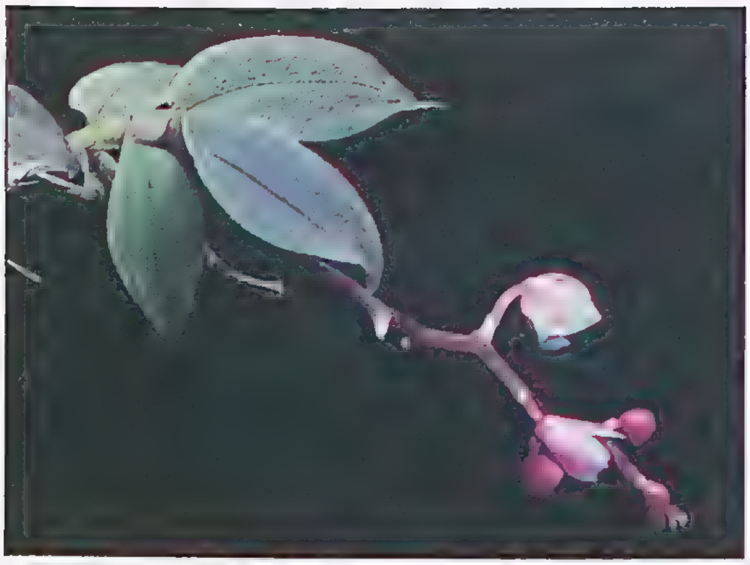
The Clustered Ones (*Glomerinae*)

This is a big group of many genera, typified by *Glomera* which has terminal flowers in a dense cluster. We have several species in our Park, of which the nicest is *Glomera aurea* whose small flowers in a dense head are golden yellow with a red-tipped labellum. Most *Glomera* species have white flowers, but all have that red tip. Their habit is grassy.

Next comes *Glossorhyncha* which is another genus of delicate plants with an almost sub-shrubby habit and small leaves. The flowers are starry and glistening white, sometimes with an incongruous black tip to the labellum. Some are deliciously scented. The best is *Glossorhyncha hamadryas*. Close to this, and by some included in it, is Schlechter's genus of *Giulianettia*. The flowers are more narrowly star-like and greenish to pinkish. The habit is like a little *Vaccinium*. Both these genera are common in the Park.

Another genus is curiously called *Aglossorhyncha*, presumably because it is not a *Glossorhyncha*. There are several species with greenish-white to greenish yellow flowers. There are many curious little orchids in the bush which look like small tufted rushes with minute orchid flowers just below the tip. One of these always grows upside down. These belong to the genus *Ceratostylis*. Others look like tufted grasses or reeds, with a few small white flowers at the tip. These are appropriately named *Agrostophyllum*. They are among the commonest orchids in the bush.

Also in this group are the two attractive genera *Epiblastus* and *Mediocalcar*. *Epiblastus* is about equally terrestrial or epiphytic, often forming big masses. The rather small flowers poke out from the leaves in bunches on long pedicels, and are bright red to pink and occasionally white in colour. *Mediocalcar*, on the other hand, has the creeping habit of a *Bulbophyllum*, but is distinguished from that genus by the way one pseudobulb comes out



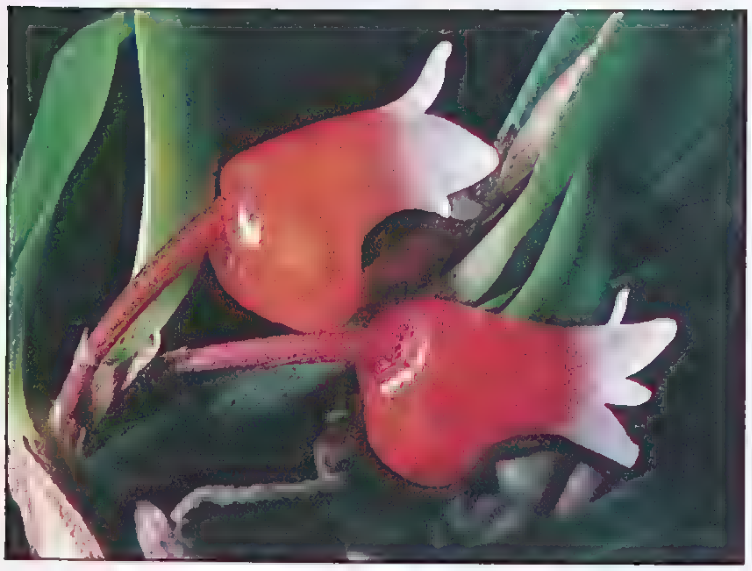
Left: ***Grosourdya sp.*** - Photo by T. Reeve

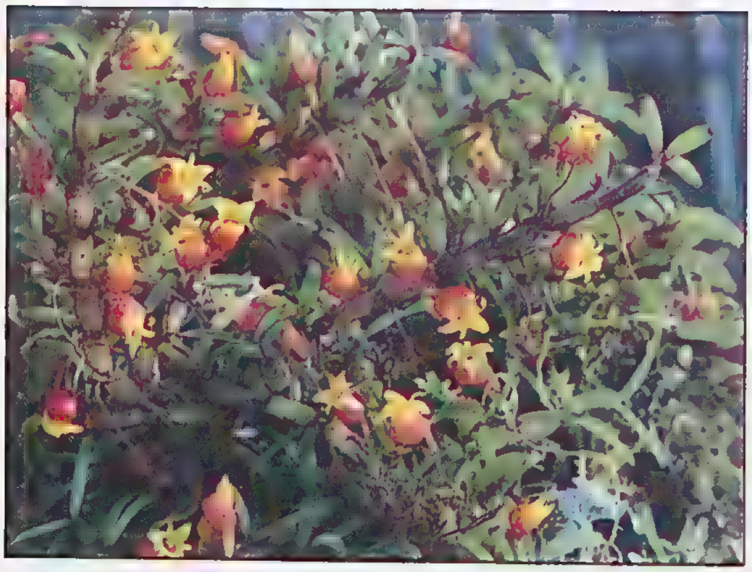
Centre left: ***Mediocalcar bifolium*** J.J. Sm.
Photo courtesy of Mrs A. Millar

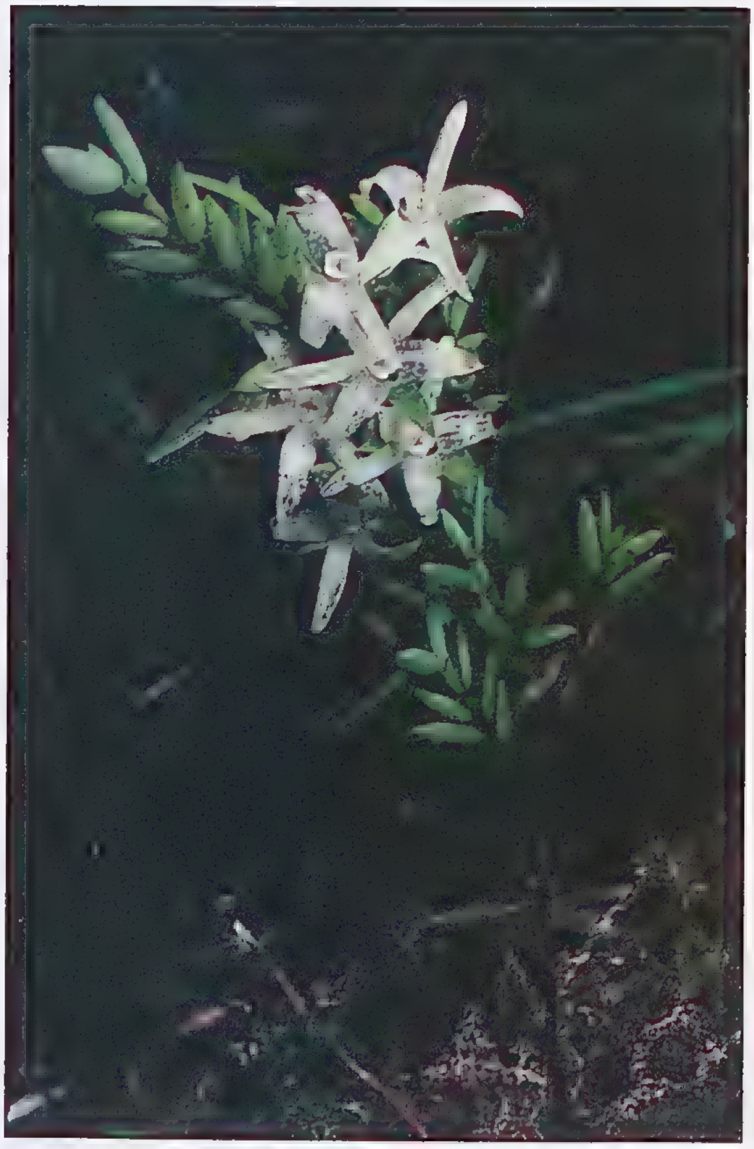
Bottom left: ***Mediocalcar sp. nov*** - A common highland species with 4 or more leaves per pseudobulb. Photo by T. Reeve

Below: ***Glossorhrycha sp.*** (See page 195).
Photo courtesy of Mrs A. Millar

These colour pictures were made possible by a grant from the Australian Orchid Foundation.







of another. The flowers are very curious, being formed mainly from the mentum which is always red, the sepals and petals being of a contrasting colour, green, yellow, orange, or pure white in one common species, *Mediocalcar bifolium.* It flowers abundantly and the flowers look like a lot of little bi-coloured globes. It has been nicknamed the 'Cherry Orchid'.

The Inconspicuous Ones

We now come to two rather unexciting groups, the *Podochilinae* and the *Thelasinae.* The first contains two genera of small tufted or creeping species with minute flowers in terminal racemes, *Podochilus* and *Appendicula.* One species of *Appendicula* hangs like moss all over the trees in the deep forest, turning purple when exposed to light. The second group contains two minute but fascinating genera, *Octarrhena* and *Chitonanthera,* distinguished by the number of pollinia, but otherwise very similar. They are only found in the high cloud forests from about 2700 m upwards. We have two species right at the top of our Park. The leaves are usually equitant and the flowers microscopic, usually orange or red. One minute unidentified *Octarrhena* which I collected on Mt Dayman is only about 2 cm high, the greenish flowers the size of a pin's head, and the glaucous succulent leaves like those of a *Sedum.*

The *Vanda* Family (*Sarcanthinae*)

These form a very homogeneous group. We have no *Vanda* species in the highlands, but we do have quite a few *Sarcanthinae.* Some of these I have not been able to identify. One which I failed to keep alive in the Park is the beautiful and conspicuous *Vandopsis longicaulis* which flourishes on a tree right in Bulolo town, at about 800 m. It has long pendulous stems and large deep red and white blotched flowers. A very fine plant. Another plant with a *Vanda*-like habit is *Cleisostoma paludosa* which has branching sprays of small fleshy flowers with a combination of green, white and mauve. This is native to Mt Gahavisuka.

We do not have the beautiful species of *Sarcochilus* which occur in Australia, but we do have a few close allies. *Pteroceras chrysanthus* has axillary flowers of bright golden yellow and *Pteroceras uniflorus* has cream flowers with violet spotting on the labellum. We have another *Sarcochilus*-like orchid in the Park with pinkish-white flowers, reminiscent of a miniature *Phalaenopsis.* I do not know what it is (It is probably the highland *Grosourdya*; T M Reeve, pers. comm.).

Other smaller genera in this group are: *Robiquetia* which has pendulous spikes of red or orange flowers; *Calymmanthera* which has branched sprays of tiny white feathery flowers; *Schoenorchis* which also has branched inflorescences of minute flowers; and *Thrixspermum* which is found mostly in coastal habitats. However, we do have a small species of this genus which grows on small twigs in exposed situations. It has reddish leaves and very occasional flowers which last only a day. These are round and yellow, like small golden coins. It has not been identified.

One of the most curious orchids is a *Hymenorchis* species, a tiny plant which also grows on twigs, usually in very humid situations. The leaves and sepals are surely unique among orchids in being dentate. The flowers are translucent, almost colourless, like glass, with a green labellum. It is rare and elusive, but occurs in the Park.

The Most Curious of All

I refer to the extraordinary genera which come under the *Sarcanthinae*, and are placed last in Schlechter's Book, namely *Microtatorchis* and *Taeniophyllum. Microtatorchis*, as its name implies, is a minute orchid with tiny green flowers opening successively on a zigzag bracteate peduncle arising from a tuft of tiny leaves, but with long green ribbon-like roots. If often dangles from twigs in high mossy forest. We have one at the top of the Park. In *Taeniophyllum*, the leaves have entirely disappeared and the ribbon-like roots have taken over their function of photosynthesis. These too tend to dangle from twigs in very humid forest, but a few minute species grow on quite exposed shrubs. I used to have a species from the Daga country of the Milne Bay Province which had a white flower nearly 4 cm across, but it has since died. We do have two others with small yellow flowers in the Park, one with very extensive dangling roots. Specimens of all have been sent to Lae, but we have not yet had any identifications.

Conclusion

This concludes the epiphytes. It emphasises the enormous diversity and abundance of the orchids of the Papua New Guinea montane forests and the importance of conserving them as more and more mining and timber projects are opening up in this developing country. Papua New Guinea surely has the richest orchid flora in the world in relation to its area.

FROM THE BACK OF THE BUSHHOUSE

Walter T Upton
PO Box 215, West Gosford, NSW 2250

One of the perks that comes with the job of Editor of *The Orchadian* is that, to some extent, you decide on the content of the journal. This gives me the opportunity to initiate a few feature articles, such as the guest editorial by the President of ANOS during the previous year, presented in this issue by Walter Upton – The Editor.

To continue the intended traditional September *From the Back of the Bushhouse*, our Editor has invited me, in my capacity as President, to say a few words on our Society today.

We are fortunate to have a very active group of councillors, all of whom are keen, clear thinking persons whose main aim is to see our Society progress.

Great steps have been taken this year towards making our Society and our native orchids known to the public in general. Over the last six months, our Marketing Subcommittee, comprising the very active Wollongong Group led by the Wollongong members of Council, have initiated much publicity. In March, 10,000 copies of a full colour information sheet, with membership application form, was printed and most of these have been distributed throughout the whole of Australia. Already our membership has greatly increased.

Apart from the considerable time factor, making our Society better known and understood and promoting our native orchids can not, unfortunately, be done without money. So, to a great degree, it is like a dog chasing its tail – if we do not have more members our Society is not fully viable and we can not get more members unless we publicize ourselves. To do this we need more money.

The Australian Orchid Foundation came to our assistance this year, giving us a grant of $2,500 to assist us to keep our publication, *The Orchadian*, up to its high standard, thus making it possible for us to promote ourselves and our aims.

The Orchadian was brought into its present form by Murray Corrigan, Mike Harrison and myself. Since then, Noel Grundon has taken over as Editor. With the help of all our Editorial Associates the journal has steadily improved. Our Production Co-ordinator, Mark Webb, must be given full praise for the great part he plays in bringing the journal together in its completed form, taking it to even greater heights.

Have no doubt, *The Orchadian* has been brought up to date by sheer hard work and to keep it this way we need more and more articles, particularly cultural articles. Our scientific and taxonomic contributors are well ahead with articles, but we must keep our journal well balanced. So we need urgently, the all important, albeit simple, article by you the member, so that our journal will appeal to us all. I am sure there is not one single member who could not write a most interesting article for us all to enjoy. At meetings we frequently tell our mates a little anecdote about our orchids. So why not write it down and share it with us all: how you grew your favourite orchid; where you saw orchids growing, describing the habitat, etc.

Feedback from our many groups tells us our Society is healthy and well. I enjoy reading the various group bulletins each month; they are full of group activities, much cultural and expert advice and lists of their large benchings of both terrestrial and epiphytic orchids all the year round.

I delight in hearing news of our members throughout Australia from the many persons who visit when travelling on holidays; this creates good fellowship. We could, however, do without the knockers who seem to do their best to take tales of gloom and doom with them and return with only the bad points they found. This does great harm, not only to us, but also to the future of our native orchids.

In Sydney, we are running another judging school with much success, but the problem of running schools for groups outside Sydney is a great worry to us. At times I wish we had unlimited funds. Our judging panel is currently considering this problem and is about to act.

Conservation still remains a high priority and our Conservation Subcommittee has kept all groups well informed of its progress.

Everything augurs well for the future with membership hopefully to reach the one thousand mark by the end of the year, while 1990 will see our First Australasian Native Orchid Conference and Show. Without doubt, this will be the greatest conference and show ever held, anywhere. We have a most energetic subcommittee under the chairmanship of Ron Wheeldon and includes a large percentage of Wollongong Group members, plus some from Port Hacking, Newcastle, Sydney and Warringah

Groups. The meetings are a pleasure to attend. I doubt if I have every known such enthusiasm; nothing is too much trouble for any of the subcommittee members. Make a note of the dates in your diary: September 28th to 30th, 1990. This is one conference you can not afford to miss. Watch for further information on the many happenings at this conference.

I was interested to read Chris Gammage's letter in *Readers' Forum* in the March issue. Some thoughts expressed to me were – "What do they want – everything given to them on a plate? In my day, we had no books, no native societies. We had to find it all out for ourselves". O.K..Maybe that is so, but surely it is up to us "oldies" to go out of our way to help the new grower or the less knowledgeable to enjoy and understand their hobby. Whilst we are helping we are spreading the word around, making more and more people aware of our native orchids, and helping to ensure that our precious native plants will be around for our children and our children's children to enjoy.

Do not just leave it to the Council of ANOS. We are only a small band. Publicize our native orchids yourselves by approaching your local newspaper and writing informative articles in it. Warringah Group approached the gardening writer in The Manly Daily and now they have regular weekly articles with drawings of the native orchids of Warringah Shire. Very commendable indeed.

Perhaps as we go about our daily chores, we should ask our neighbour – "Have you got a native orchid growing in your garden?"; then tell them all about our unique plants. Make them want to own one and know more about it. Suggest they come along to the next group meeting and buy one from the sales table. Impress upon them not to collect orchids from the bush (there is a big fine) as those already in our collections are usually the superior ones. If you are giving a native orchid to a new grower, give him a good clone, not a cast off; that way he will see the real beauty of both our native orchid and us, the caretakers of our hobby.

Remember – "A thing of beauty is a joy forever".

FIRST AUSTRALASIAN NATIVE ORCHID CONFERENCE AND SHOW, 1990.

Interest in the orchids of Australia, New Zealand, New Guinea and adjacent islands of the Pacific Ocean, has grown enormously in the past decade. It is therefore timely that the First Australasian Native Orchid Conference and Show will be held at Wollongong in September 27th–30th, 1990. This unique event will be run by ANOS and hosted by its Wollongong group.

Conference Venue

The University of Wollongong Pentagon is an ideal venue with excellent conference facilities and being surrounded by spacious grounds and gardens, with quick access off the Sydney expressway and ample parking. Adjacent to the University is the Wollongong Botanic Gardens and the Rhododendron Park.

Conference Logo and Badge

The logo and badge depict *Pterostylis gibbosa*, now endemic only to the Wollongong area and one of Australia's rarest orchids.

The Conference

The conference will be held over three full days. It will cover such topics as the origins, distribution, propagation, history, hybridisation, nomenclature and conservation of Australasian orchids. Those attending will also be entertained by a full social program.

First National Australian Native Orchid Show

Starting one day earlier than the conference and running for four days, the First National Australasian Native Orchid Show will be hosted by the Wollongong Group of ANOS. The University of Wollongong's Sporting Complex has been chosen for this event because of its close proximity to the Pentagon, easy access and parking, and large undercover floor area. In close proximity to the show will be a large commercial area where many of our beautiful native species and hybrids can be bought. For orchid badge collectors, this area will provide an ideal opportunity to meet and buy or exchange badges.

First Australasian Native Orchid Art and Photographic Show

This exciting addition to the conference and show will give a rare opportunity to view and buy paintings of Australasian orchids by noted botanical artists. Held at the same time will be an extensive photographic show and competition with prizes for the best exhibits. We expect to hold this section in the same building as the Orchid Show on the first floor overlooking the Orchid Show.

Conference Tours

Tours are being organised before and after the conference to cater for your many interests. Wollongong with its white sandy beaches, waterfalls, mountains, National Parks and many recreational activities will entertain adults and children alike. For those who would like to see many of the 200 species of orchids which can be found growing in the area, guided tours are being arranged.

General

Wollongong is a thriving city of around 250,000 people. Nestling between the mountains and the sea, it has the advantage of a magnificent coastline, spectacular mountain lookouts, cascading waterfalls, secluded bushland, rare native wildlife and rainforests with many beautiful beaches.

For further information contact: The Conference Co-ordinator, Wollongong Uniadvice Ltd., The University of Wollongong, PO Box 1144, Wollongong NSW 2500.

AUSTRALIAN NATIVE ORCHID HYBRIDS

(New registrations by the R.H.S. from lists in *The Orchid Review*, May – July, 1989.)

NAME	PARENTAGE	REGISTERED BY
Cymbidium		
James Webeck	*suave* x *canaliculatum*	E. Webeck
Dendrobium		
Dainty Gem	Jombock x *kingianum*	W. Upton
Delicate Gold[1]	*gracilicaule* x Specio-kingianum	D. Cannon
Delicate King[1]	King Falcon x Specio-kingianum	D. Cannon
Falcon Star	Allyn Star x *falcorostrum*	D. Cannon
Golden Nuggett[1]	Eureka x *gracillimum*	D. Cannon
Golden Thel	Alan Printer x *tetragonum*	N. Eldridge
Gracious Nuggett	Eureka x Gracious Cascades	D. Cannon
Lemon Magic[1]	Ruppiosum x *tetragonum*	W. Upton
Mini Pink[1]	Peewee x *johannis*	Lee Huat Lai
Ocker's Castle	Susan x Aussie Bonanza	G. Sobey
Rochelle	*gracilicaule* x Kingrose	R.M. Turner
Sweet Victoria	Ella Victoria Leaney x Susan	D. Cannon (R. Bedford)
Rhinochilus		
Vera	*Sarco. hartmannii* x *Rhincs.* Dorothy	J.K. Irvine
Sarcochilus		
Jane	*ceciliae* x *australis*	W. Upton
Kathy	Mavis x *ceciliae*	W. Upton

[1] These registrations will be listed as follows in the ANOS publication *A Checklist of Australian Native Orchid Hybrids*:

Delicate Gold	*gracilicaule* x *X delicatum*	D. Cannon
Delicate King	King Falcon x *X delicatum*	D. Cannon
Golden Nuggett	Eureka x X *gracillimum*	D. Cannon
Lemon Magic	X *ruppiosum* x *tetragonum*	W. Upton
Mini Pink	Suzanne x *johannis*	Lee Huat Lai

THE CAPACITY OF *DENDROBIUM SPECIOSUM* SM. TO CARRY SEED CAPSULES TO MATURITY

Peter B Adams
School of Botany, University of Melbourne, Melbourne.

Summary: There is a set limit to the number of seed capsules which develop to maturity following the pollination of large numbers of *D. speciosum* var. *speciosum* flowers. It is proposed that restriction of plant resources in reproductive activity is part of a survival mechanism which balances investment in seed production for any one flowering, with needs for vegetative growth, flowering and seeding in future seasons. Horticulturalists planning to raise seedlings using *D. speciosum* as the pod parent are advised to set a limit on the number of artificial pollinations to avoid loss of seed capsules during their development.

Introduction

Dendrobium speciosum is a large lithophytic and epiphytic orchid which produces a massive floral display but few mature seed capsules. In most flowering seasons, less than 10% of flowers develop capsules in the natural habitat (Adams and Calder 1982). The self infertile breeding system contributes significantly to this finding; many pollen transfers between flowers on a single plant do not result in seed pods. A few individual plants may occasionally be self compatible, but for most, capsules only begin to develop following transfer of pollinia between genetically different plants (Calder, Adams and Slater 1982).

There may also be factors within the plant which set limits on the number of capsules reaching maturity. Considerable metabolic energy is apparently expended in producing the relatively large seed capsules containing up to a million seeds.

This study comprises two sets of observations which relate to the capacity for seed production in *D. speciosum* var. *speciosum.* The fate of developing capsules was followed in a colony of plants in East Gippsland, Victoria, in spring–summer 1985. The results were compared with experimental pollination of varying numbers of flowers on a plant of the same variety in a Melbourne native orchid collection during the same period.

Materials and Methods

Observations of D. speciosum *in East Gippsland*

A total flower count was made in October 1985 in a colony of 40 plants, including 16 plants of flowering size, nine of which were in flower. Flowering plants ranged in diameter from 30 cm to 1 m, except for a very large plant (No. 5) which was probably a complex of three initially distinct plants (Table 1).

The number of developing seed capsules was recorded two weeks after the senescence of flowers. A recount was made in February 1986 when capsules were mature and liberating seed. Climatic conditions during the October to February period were fairly typical of the spring–summer period with average rainfall and temperature.

Experimental pollinations (Loading experiments)

A large plant of *D. speciosum* var. *speciosum* comprising 18 pseudobulbs (65 cm in height), each bearing two to four leaves, and six bare pseudobulbs was selected for the experiment. It was maintained in a Melbourne suburb in a sunny position with partial shade (30%), similar to the situation of plants in the natural East Gippsland habitat.

Seven racemes of 30–45 flowers were produced in the 1985 flowering season and these were experimentally pollinated in early September 1985. On racemes one to six, pollinia from a genetically different plant of *D. speciosum* var. *speciosum* were transferred to 35, 16, 8, 4, 2, and one flower(s) respectively, and the seventh spike was not pollinated.

The number of developing seed capsules was counted every two weeks from pollination until late December 1985 when the capsules dehisced, liberating seed. The plant was observed for growth and flowering over the next two flowering seasons in order to assess any major effects of loading the plant with a large number of developing capsules.

Results

East Gippsland colony

The number of flower capsules developing initially and the number of capsules liberating seed at maturity in the East Gippsland colony are shown in Table 1. Nine flowering plants produced a total of 15 racemes. Effective pollination resulting in the development of seed-bearing capsules, occurred

Table 1. Numbers of seed capsules developing initially and reaching maturity in an East Gippsland colony of *D. speciosum* var. *speciosum*.

Plant No.	No. seed capsules initiated	Total No. of flowers	No. seed capsules at maturity	% Fruit[a]
1	4	35	3	9
2	5	50	5	10
3	8	61	1	2
4	8	49	5	10
5[b]	35	301	17	6
6	1	30	1	3
7	10	56	7	13
Total	71	582	39	53
Mean	10	83	5	9

[a] % Fruit = 100 (No. flowers / No. mature seed capsules)

[b] Unusually large 'plant', diameter 3 m, probably a complex of three initially distinct plants

on only seven plants. Of a total of 547 flowers in the colony, only 71 (13%) initiated seed capsules. At seed liberation in February, 39 capsules were present, indicating that 56% reached maturity and 44% had dropped from the plants prior to maturity. The percentage of capsules initiated was highly variable between different plants, ranging from 12% to 100%. There was no evidence of grazing or other damage to capsules caused by animals.

Experimental pollinations

Following experimental pollination, a high percentage of flowers developed seed capsules (Table 2). Capsule numbers declined most rapidly within the first 50 days on racemes with four or more pollinations. There was then a slow decline in capsule numbers between 50 days and maturity at 120 days. When only one or two flowers were pollinated on a spike, capsules developed from each pollination.

Post-pollination growth and subsequent flowering

There was little new growth on the experimentally pollinated plant in the six months following pollination, while similar plants without capsules produced vigorous new growths. No shrivelling of pseudobulbs, die back, or leaf drop occurred during this period. The first new pseudobulbs emerged in March 1987 in a ratio of one new growth to four older growths. Flowering did not occur in spring 1986 and 1987, but this poor flowering record was also observed in other *D. speciosum* which did not bear seed capsules in 1985.

Discussion

Limited seed production and reproductive strategy

Flowering and seed production play a major role in the establishment, survival and spread of plant species. Development of flowers and fruits may require heavy resource costs and divert metabolic energy away from vegetative growth (Evanson 1983). *D. speciosum* and other Australian dendrobiums with mass floral displays invest considerable resources in flowers and large fruits. If most flowers were converted to seed capsules, a serious depletion of resources could threaten plant survival. The results of natural and experimental pollination reported here indicate that there is a set limit on the number of capsules developed to maturity. Environmental conditions of temperature and rainfall were very suitable during pre- and post-pollination periods, so these factors would be unlikely to contribute to the observed maximum limit of four to five capsules per spike. Parallel experiments with *D. kingianum* produced similar percentages of fruit set, indicating similar limits to seed production (Adams 1988, in press).

The abscission of capsules from racemes in-

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Diuris purdiei - An orchid in danger

Dr. Bevan Buirchell
Conservation Spokeperson for WANOSCG
82 Kent St
East Victoria Park
Western Australia 6101.

It is with great urgency that I write to request the assistance of the Australasian Native Orchid Society in our endeavour to protect four rare and endangered orchids that are in imminent danger of being destroyed by urban development. The area of concern is natural bushland in a suburb called Canning Vale some ,15km south of Perth. The area consists of *Banksia* woodlands on sand dunes and a large area of winter wet swamps. The proposed development will convert all this land into suburban building blocks. This means total destruction of the natural bushland and importation of land fill into the winter wet swamps.

The *Banksia* woodland is the habitat of three rare orchids, *Drakaea jeanensis*, an unnamed *Drakaea* species and an unnamed *Caladenia* species. There are approximately 200 of these orchids in the habitat in total. The winter wet swamp area contains *Diuris purdiei*. Approximately 1000 + plants were seen in this area in 1987, the largest population of *Diuris purdiei* in W.A. Infact this population would account for approximately 75% of all known plants of this orchid. Special rural developments have already occurred in the near vicinity in spite of *Diuris purdiei* being present.

The 'Wildlife Conservation 1950 Act' which was legislated to protect these plants has some glaring deficiencies. The Act allows for the removal or destruction of rare plants only after permission has been granted by the Minister for Conservation and Land Management. If the Minister refuses permission then the Government has to compensate the land owner for the loss of revenue/value of the land. However, if the Government has not purchased the land within five years the land owner may automatically go ahead with the planned development. The current planned development for this land is valued at approximately $154m. The land itself is probably worth $10m, well beyond the small budget of $1m the Department of Conservation and Land Management has been allocated to buy land for reserves.

The situation gets more critical when one considers that the State Government is rushing around madly trying to open up more land within the metropolitian area for housing development. Somewhere along the line a "Political" decision will have to be made, to either spend a large sum of money to save these orchids or to destroy them in the name of progress. The newly elected Government now has the political breathing space to make the later decision without any grand opposition except from the conservation movement.

We are requesting assistance from A.N.O.S. and all its members to contact our State Minister for Conservation and Land Management and to express their opposition to the destruction of these rare and endangered orchids (especially the destruction of 75% of the known plants of *Diuris purdiei*). The current Minister is Mr. Taylor and can be reached at 32 St. George's Terrace, Perth, W.A. 6000. If there is any action that you can take at the Federal level please do so.

I would appreciate it if you could circulate this letter to as many of your members as possible and to other affiliated groups.

Yours sincerely,

Dr. Bevan Buirchell

P.S. A total of 47 species of orchids have been recorded within 2km of this area making it one of the richest orchid habitats in Western Australia.

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....
....

Premier Mr Peter Dowding,
Parliament House,
PERTH 6000
Western Australia

Dear Premier,

RE. Diuris purdiei, commonly known
as Purdie's Donkey Orchid

I strongly request that you protect the "gazetted", rare and endangered plant, Purdie's Donkey orchid in its natural habitat in Canning Vale.

The Minister for Conservation and Land Management has agreed to the Developers funding "an attempt to both translocate the existing plants (1300) to another, secure site, as well as to establish colonies 'in captivity'". Experimenting with Rare flora, especially with a population that accounts for the majority of plants, will subject this species to incalculable risks.

Conservation through creation of reserves to protect habitats and thus individual plants has proved itself over the years and must continue. An appropriate sized reserve should be created around the natural habitat of Purdie's Donkey orchid in Canning Vale.

I look forward to a written assurance that this habitat will remain an intact home for Purdie's Donkey orchid and a treasure of the state of Western Australia.

It is imperative that our Government protect our rare plants.

Yours faithfully,

....

....

LIST OF SUPPORTERS

Pofessor John Pate
Sir Crawford Nalder
The International Union for the Conservation of Nature (IUCN)
Species Survival Committee
International Orchid Commission
Royal Horticultural Society of the United Kingdom
Australian Orchid Foundation
Australian Native Orchid Society
Western Australian Native Orchid Study and Conservation Group
Wollongong & District Native Orchid Society
Townsville Orchid Society
Western Australian Wildflower Society
Conservation Council of Western Australia
Greenforce
Canning Vale Ratepayers Group
Pollution Action Network
Garden Graphics
Householders for Safe Pesticide Use
Everbloom Nursery
Naturals of Subiaco
Lebro Wildflowers
Wisdom Books
Windsor Nursery
Australasian Native Orchid Society, Sydney Group

FOLD HERE

PREMIER MR PETER DOWDING
PARLIAMENT HOUSE
PERTH 6000
WESTERN AUSTRALIA

FOLD HERE

Table 2. Fate of experimental pollinations in loading experiments on *Dendrobium speciosum* var. *speciosum*.

Raceme No.	Total No. flowers	No. flowers pollinated	No. capsules present after pollination (days)				Success rate (%)[b]
			20	50	70	120[a]	
1	45	35	35	6	4	4	11
2	44	16	14	8	5	5	36
3	43	8	8	5	3	3	38
4	45	4	4	2	2	2	50
5	35	2	2	2	2	2	100
6	30	1	1	1	1	1	100
7	32	0	0	0	0	0	0

[a] Dehiscence occurred between 115 and 125 days after pollination.

[b] Success rate = 100 (No. capsules on day 120 / No. flowers pollinated).

itiating large numbers of fruit may be regarded as a protection effort. Three to five mature capsules per spike supply large numbers of seeds, affording the possibility of many seedlings if climatic conditions are suitable for establishment. Carriage of 17 capsules to maturity on the experimental plant did not cause an obvious setback in general condition, and only a temporary delay in vegetative growth. In the East Gippsland colony, each spike developed approximately four capsules to maturity and the plants were also not adversely affected by this level of seed production.

When capsule production is unlimited, as in experimental pollination of *Cymbidium tracyanum*, the effect of loading racemes with many capsules is to seriously deplete resources, resulting in withering of pseudobulbs and long delays in further vegetative growth and flowering in future seasons (Adams 1988). In contrast, the resources allocated to reproduction of *D. speciosum* are apparently conserved, allowing vegetative growth and seed production to ensue in future seasons, thereby increasing the opportunities for new generations of seedlings to succeed.

Growth rates following experimental pollination and those seen in earlier studies of *D. speciosum* in East Gippsland (Adams and Lawson 1984, Adams 1986) indicate that there is a balance between seed production and vegetative growth. On average, one new growth appears in relation to each group of about four older canes, and these are associated with one raceme of 28 to 40 flowers, giving rise to three or four mature seed capsules. This group of pseudobulbs with flowers and fruits may be considered as a reproductive unit for *D. speciosum* (Fig. 1). Each plant and the colony as a whole consists of a number of reproductive units in which vegetative increase is balanced by a limited investment in flower and seed production. The possibility of translocation of metabolic resources from non-flowering pseudobulbs to flowering ones requires investigation.

Practical limits to seed production for the horticulturalist

Experimental and field observations of *D. speciosum* confirm that plants of this species have inherent limits to maximum seed production in a flowering season, protecting against depletion of energy resources that could threaten survival. For *D. speciosum*, *D. kingianum* and probably other Australian dendrobiums, it is advisable for the horticulturalist to make only a few pollinations on each plant. One or two pollinations per strong spike are likely to result in mature capsules, but heavy loading of plants runs a risk of losing valuable capsules prematurely. A reasonable approach would be to attempt only one or two pollinations per "reproductive unit" of four pseudobulbs associated with one raceme (Fig. 1).

Some other orchids, for example *Cymbidium* and *Sarcochilus*, develop mature capsules from almost every pollinated flower, and may be seriously weakened as a result (Adams 1988). Similar limits should perhaps be set for the maximum number of pollinations made in seed raising attempts by com-

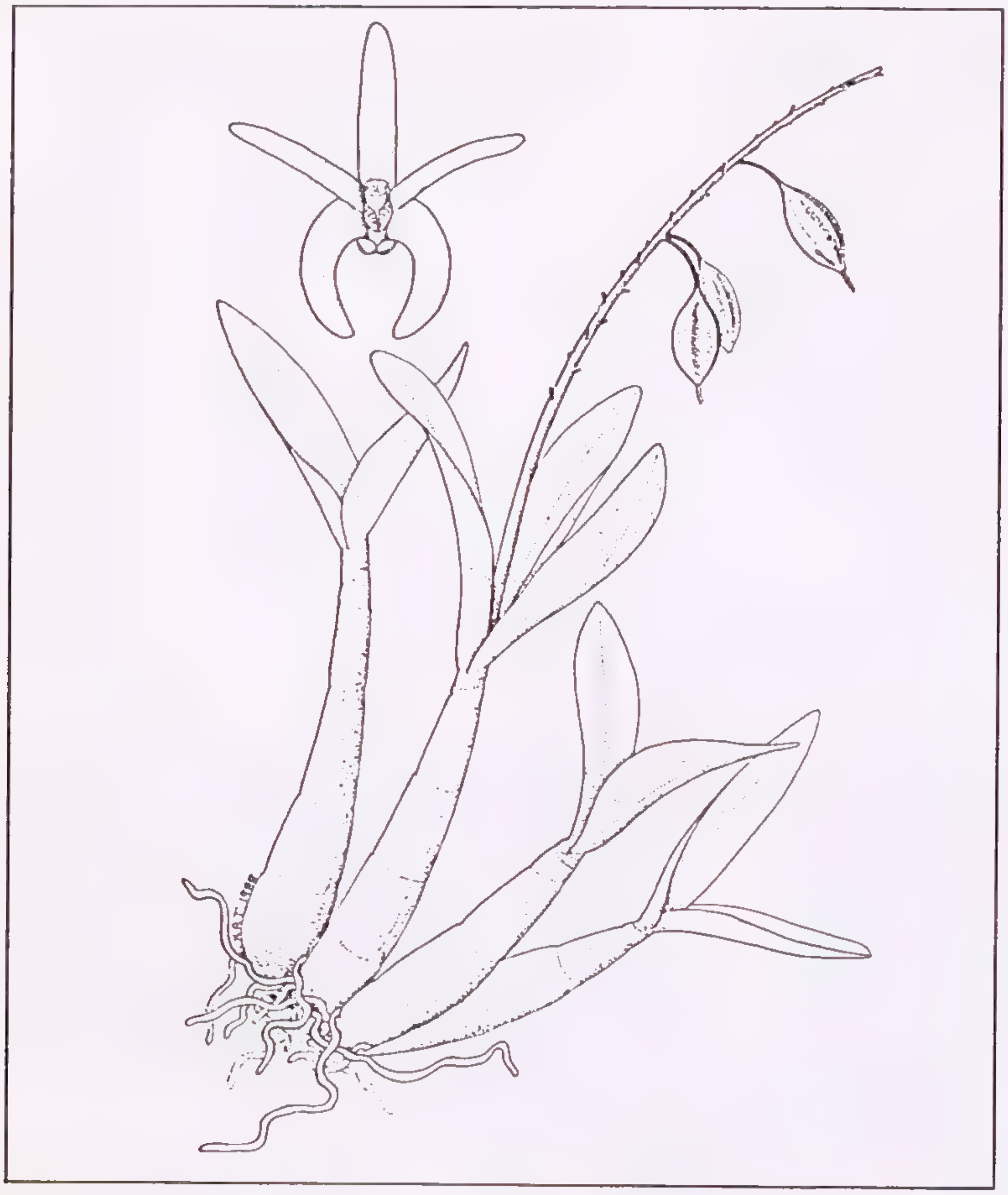

Figure 1. Reproductive unit - *Dendrobium speciosum*:

4 canes, 1 new cane; 1 spike, 28 flowers, 3 capsules.

mercial and hobbyist growers. If the recommended limits are exceeded, there is a definite risk that valuable irreplaceable stock plants may suffer set backs or be lost.

Acknowledgement

I wish to thank Kevin Thiele of the Botany School for the illustration of *D. speciosum*.

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SOME PROBLEMS OF CONSERVATION OF *DIURIS PUNCTATA* IN THE MELBOURNE AREA

M C Appleby
95 Broadway, Camberwell, 3124

Diuris punctata **was formerly locally common in several sites controlled by the Victorian Railways. I first saw the vast patches of orchids on railway land between Beaconsfield and Officer some 50 years ago as a child on a Field Naturalist's Club excursion in early November. A small colony at Heathmont and a larger one at Langwarrin further extended my interest in this orchid, and in the problems associated with its survival.**

The Beaconsfield Group

In the 1930's, there was a single track, non-electrified railway line between Dandenong and Warragul. In the Beaconsfield-Officer stretch, the rail was raised above the surrounding area on red-gum sleepers over bluestone ballast. At each side of the line, extending about 1.5 m from it was flat ground, giving onto a drainage ditch 0.5 m deep and about 1 m wide. Low ground, about 5 m wide edged by a bare firebreak was covered by a herbfield of native plants fenced off from roads and farmland, and protected from intrusion of animals by grids at rail crossings.

Plant growth in this area was controlled by annual burning-off in mid-autumn. In the water-retaining, pinkish, loamy clay soil, colonies of *Diuris punctata* of about 20 x 4 m consisting of hundreds of thousands of individuals flourished. They were of the deep mauve form with long, narrow, olive "tails". A few individuals were larger-flowered and pale lilac. All were heavily scented.

Other orchids found at that time on the railway land were much less common and included *Thelymitra pauciflora, Microtis unifolia, Diuris sulphurea, Thelymitra carnea* and *Caladenia dilatata*.

The herbfield was a grassland of *Danthonia* sp. and *Themeda australis*. Large numbers of other monocotyledonous plants flourished, including *Burchardia umbellata, Dichopogon strictus*, and *Xanthorrhaea minor*. Of the dicotyledonous plants, the legumes *Daviesia latifolia* and *D. linearis, Dillwynia ericifolia* and *Acacia melanoxylon* formed scattered clumps. Composites were widespread, including *Helichrysum apiculatum, H. scorpioides, Leptorhynchus squamatus, Craspedia uniflora* and *Podolepis jaceoides*. The last mentioned were home to small, black, stingless native bees (*Lasioglossum* sp.) which certainly visited the *Diuris* flowers and may have been a pollinator. Yellow swamp plants, *Bulbine bulbosa* and *Villarsia reniformis* flourished in the wet ditches. In early November the herbfield was a mass of purple, gold and white sweetly scented wildflowers.

Railway works, usually done during the cooler months, had little effect on the herbfield. However, in the great postwar industrialisation of the Dandenong area and expansion of residential development, the line was duplicated, and later electrified. Heavy equipment and sleeper dumps managed to stay clear of all but one of the five *Diuris patches*, but the disturbance allowed colonisation by weeds, mainly Yorkshire Fog grass (*Holcus lanatus*) and vetches (*Vicia* spp.)in the herbfield and blackberry (*Rubus* sp.) at the edge of the ballast.

The method of plant control changed in the 1960's from burning to herbicide spraying, and the timing was changed from mid-autumn to mid-spring, to give maximum effect, and was directed particularly at the Blackberries at the edge of the ballast. However, an episode in the mid-1970's resulted in spraying of the entire herbfield, with devastating results to all the native plants. The orchids, without exception, were twisted of stem, with weak over-long stems and lax leaves. The flowers were mis-shapen and often abortive. Similar damage was seen in the *Burchardia, Dichopogon* and *Villarsia*, while the dicotyledonous plants looked severely scorched, and bore few small flowers. No black bees were seen.

I contacted the Railways to find out more about this disaster; the Lands Department had carried out the work under Railway's orders. I also discovered that the Railways had an Environment Officer, to whom I gave exact location of the patches so he could see for himself what had happened, and so that they could be monitored in the future. I also asked several organisations for help. The Herbarium, though sympathetic, could neither do nor suggest any way to alleviate the problem. The Australian Conservation Foundation saw the issue as a small, local one, ignoring the main problem: the widespread and incautious use of herbicides. I did not know then of any organisation concerned with the well-being of native orchids.

The year following the first spraying, there was some recovery of the orchids. However, their numbers were much reduced, and over the five patches, only a few hundred plants were found. *Diuris sulphurea* disappeared entirely from that time. Annual spraying was performed more carefully from that time, being confined to the blackberries, although there was some drift to the ditch. There was little recovery of the *Burchardia* and *Dichopogon* over the next five years. Line work was necessary more frequently with the increased rail service and larger numbers of heavy brown-coal trains from Yallourn, and the number of *Diuris* diminished annually, while the weeds flourished. None of the people whom I met photographing the few isolated orchids had any solution to the looming problem of their eventual demise.

The final blow was the clearing of the ditch in 1986, when the overburden of soil and uprooted plants was piled onto the tiny orchid-bearing strip of remaining herbfield.

The Heathmont Group

About ten plants of *Diuris punctata* were found in swampy clay soil adjacent to Heathmont Station. The plant community was similar to that of the Beaconsfield group, although there were no *Podolepis*, and several species of eucalypt (*Eucalyptus obliqua, E. dives* and *E. cinerea*) formed an open forest in the area, with a few *Leptospermum scoparium* bushes. No black bees were seen here.

The plants appeared annually, but most flowers were picked or trampled, and no seeding heads were ever seen. The final episode for this small group came in the postwar housing boom of the late 1940's, when, without warning, an asphalted car park was constructed over them.

The Langwarrin Group

I became aware of this group in the late 1970's, when the Beaconsfield group was in serious decline, and again discovered it in the course of a Field Naturalist's outing. It is on railway land designated for a goods yard. The soil is black, peaty sand, and it is swampy. A few scattered eucalypts (*E. viminalis* mainly) edge it, and the orchids are scattered through a typical coastal heathland where *Leptospermum scoparium* and *Epacris impressa* form a prickly guard, and *Pattersonia longiscapa* adds to the purpleness of the heathland in November.

The first time I saw this group, a narrow dirt track separated the orchid patch from a narrow native herbfield at the edge of the ballast. Fences along the railway reserve were intact on one side (by farmland) but there were gaps on the road side. There were about 200 *Diuris* in a rectangular area of about 50 x 5 m.

The area was visited at intervals of about two years, the last in November 1986. On successive visits before that time, a progressive diminution of the number of flowering *Diuris* was noted. There was no burning or spraying regime at all obvious in the area, but the dirt track had widened from 2 m to 4 m at the expense of the orchid-bearing land. In 1986, during my visit, three trailbikes and one four-wheel-drive vehicle came over the track, cutting over the orchid-bearing land. There were about 30 flowering *Diuris*, some insect-eaten, at that time. Some small, black native bees were seen on *Burchardia* heads.

Discussion

It is a catastrophe that this orchid, noted by Nicholls (1969) as "the massed flowers presenting quite a wonderful display of rich colour", and by Rupp (1943) as "among the most beautiful of our terrestrial orchids", should have met with extinction in an area where it was known to be prolific. The impending doom was noted by Cochrane *et al.* (1968) who believed that the decline was due to grazing on many of its former haunts.

In the situations described above, spreading urbanisation, increased rail use and need for parking at stations have been the initial causes for the decline. These have been followed by a change in practice of keeping railway land clear, from the relatively benign autumn burn using much manpower to the more efficiently applied herbicide sprays.

Failure of communication must be blamed; many people knew of the orchids but no-one seemed to know what to do, or to whom to apply to protect the patches. Even after the disastrous spraying, no obvious action was taken to protect or designate the patches so that future work could avoid them, although the Environment Officer was supplied the necessary details. Paradoxically, weed growth has increased greatly since the use of herbicides, the species being mainly introduced grasses from the adjacent farmland.

I noted a lack of willingness to help an individual trying to prevent further decline. It would seem, from my later experience in conservation matters, that groups presenting well-informed material to Government authorities have a better chance than a sole person.

In the instance of the Langwarrin orchids, weed growth, while undoubtedly a threat, takes second place to damage by vehicles and soil compaction. Fencing has been thought to be ineffective here, given the amount of vandalism locally.

Conclusions

1. Communications must not fail. Notice of works to be done on Railway land should appear at local stations, and in the Public Notices columns of local and state daily newspapers at least one month before the starting date. If work is done by one Government authority for another it should be ascertained beforehand whether there is any area to be avoided because of its conservation value, and it should be clearly demarcated on the ground well in advance of the work, by people who know exactly what they are protecting. Environment officers should make themselves aware of sites of import to threatened native species (not just orchids). Liaison with special groups such as ANOS should be on their agenda. Advertisement for the necessary information in such organisations' newsletters could be useful.

2. Reduction in the use of herbicides and their strict control on public land is desirable. Consideration should be given to a controlled fire regime, as many orchids flourish in post-fire conditions.

3. When the numbers in a patch are reduced from hundreds to tens, the subsequent survival of the plants may be jeopardised by even small changes in the environment. At this time, some form of rescue work may need to be done. Relocation has its hazards, and more may be lost than gained if it is not done expertly, with as much study of the environment as possible. Seed collection and artificial propagation may be necessary to preserve genetic variability in a patch of critically small size. Perhaps a state centre for this type of work could be set up, as it is highly specialised. "Bedding out" in suitable protected areas (such as the Cranbourne branch of the Royal Botanic Gardens, Melbourne) could be an interesting and useful project for ANOS. Meristem culture should be reserved for only the most extreme conditions.

4. Public education, to enable people to know their native plants before it is too late, is always a process charged with uncertainty. It may make a species more vulnerable by over-visiting in the wild, and to vandalism of the known areas.

Acknowledgements

I am eternally grateful to the late Mr Charles French Jr. who first showed me the great patches at Beaconsfield. My father, the late Dr B L Stanton, encouraged my interest in Victoria's orchids and wild places.

Mrs Peggy Mitchell of Mt Eliza showed me the Langwarrin orchids.

My husband, Robert, and our children have allowed me great latitude in continuing my interest in orchids. Bob and my son, George, have documented a large number on colour slide, and have put up with my using them as a critical audience in the preparation of this paper.

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NEWS FROM AROUND AND ABOUT

ANOS JUDGES PANEL

At a recent meeting of the ANOS Judges Panel James Walker stood down as Registrar owing to the dual pressures of business and of setting up a country property for his eventual retirement. He will remain an active member of the Judges Panel. James' term as Registrar saw an increase in activity in ANOS generally, and in the Judges Panel in particular, as we are now actively engaged in judging native orchids at many of the annual suburban and country shows as well as the ANOS Groups. Our thanks to James for a job well done.

The duties of Registrar of Judges will now be the responsibility of Sid Batchelor, who is currently, with the assistance of other senior judges, conducting classes for twelve very keen student judges. The course is long and difficult, but a good pass rate is expected and this will help to ease the pressure on our present judges.

Congratulations to Ron Wheeldon and Gerry Walsh on their elevation to the status of Full Judge. Their contribution as judges will be very much appreciated.

Sid Batchelor
Registrar of Judges, ANOS Judges Panel

AUSTRALIAN ORCHID FOUNDATION FIELD TRIP

It is with regret that the Foundation finds it necessary to cancel the proposed First Australian Field Conference, 29 August to 5 September 1990. The Hotel complex, around which the program was intended to operate, has changed hands, and the new owners have advised that the intended accommodation area would be demolished in due course, in the reconstruction plans. All registration deposits have been or will be returned to those who have indicated their interest. Unfortunately, there was no alternative site or accommodation that was available in this rain-forest region.

OBSERVATIONS ON THE POLLINATION OF *CALEANA MAJOR* R.BR. BY MALE SAWFLIES (*PTERYGOPHORUS* SP.)

R Bates
38 Portmannock Street, Fairview Park, SA 5126.

***Caleana* is a monotypic orchid genus. The single species, *C. major* R.Br., commonly called Flying Ducks or Duck Orchid, is endemic to eastern Australia from south-east Queensland through NSW, Victoria and Tasmania and as far west as Adelaide, SA. It occurs usually in small loose colonies in sandy or gravelly soils of heath or woodland.**

Introduction

The mechanics of pollination of *Caleana major* were first discussed by FitzGerald (1880) who noted that the labellum was movable and experimented with ladybird beetles which he persuaded to climb onto the labellum. He noted how the labellum flipped back into the bowl formed by the column wings, thereby imprisoning the insect which wriggled free after 2 minutes but without removing the pollinia. FitzGerald even resorted to such treachery as placing "a little honey on the front of the labellums" so that he could observe flies being captured. But his only reference to a natural pollinator was that his friend "Mr Daintrey ... had seen a large fly imprisoned in a Caleana ...". FitzGerald also noted two other features relating to the pollination biology of *Caleana major*. Firstly, he had observed that the flowers are extremely long-lived (up to 8 weeks for a single flower) and, secondly, flowers are rarely pollinated in the wild.

Eighty years later, Leo Cady captured, apparently for the first time, the pollinator of *Caleana major*. This was at Narooma, NSW, and the insect was identified as a male sawfly (*Lophyrotoma leachii*). Cady noted that, unlike FitzGerald's beetles and flies, the sawfly removed some of the pollinia as it struggled free (Cady 1965). Cady did not conjecture as to what attracted the sawfly to his *Caleana*, but it is known that the flowers are not perfumed, nor do they offer a food reward. However, their colour scheme of maroon and green would suggest sexual attraction (Stoutamire 1983) and it is known that species of the allied genus, *Paracaleana*, are pollinated by sexually attracted male wasps (Beardsell and Bernhardt 1982; Bower, pers. comm. 1989). The best chance of observing pollination of *Caleana* seemed likely to be from using the wasp baiting methods discussed by Stoutamire (1983) and Bates (1985).

Meanwhile, the present writer had observed South Australian populations of *Caleana major* over a period of twenty years. Remarkably, only one seed capsule was located in all that time. Occasionally, flowers were shifted in an attempt to attract pollinators but without success. The only insects ever observed in the flowers were beetles

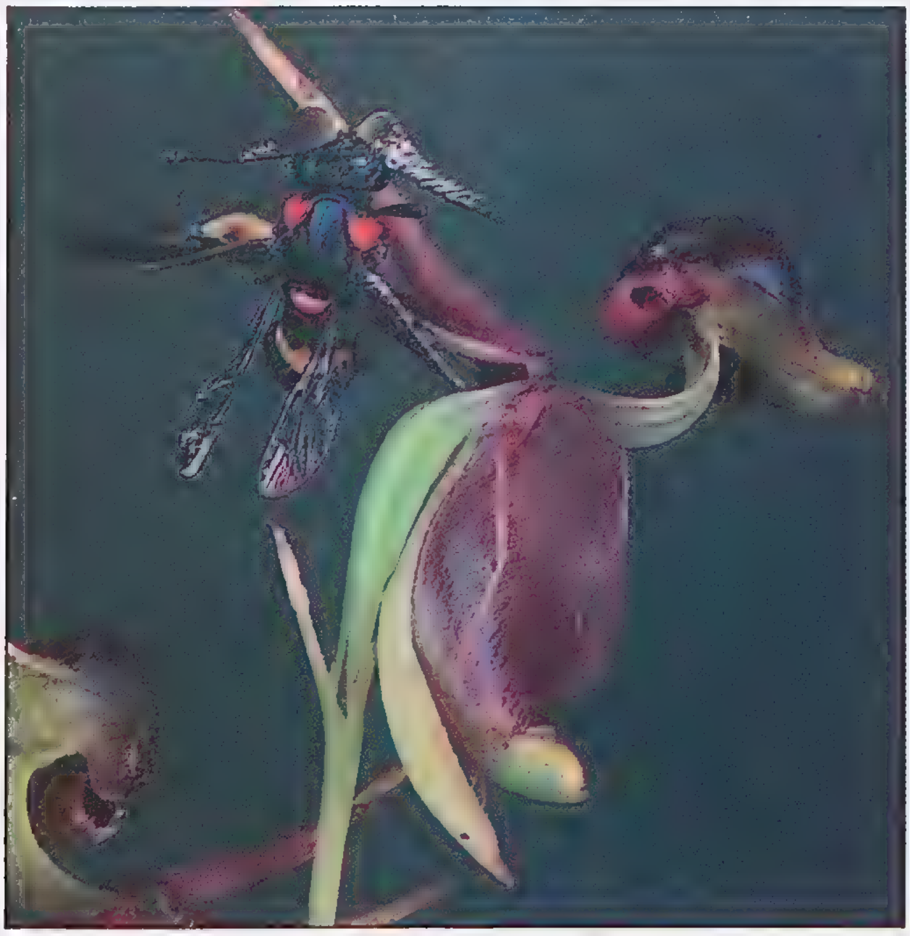

Fig. 1. Sawfly on *Caleana major.* Photo. by D. Beardsell.

(Bates 1978) but it was later determined that these were not successful pollinators. However, an extended 3-month trip to the eastern States during the spring/summer flowering season of *Caleana* in 1987 provided the opportunity of observing pollination of *C. major.*

Methods and Observations

Flower spikes of *Caleana major* were carried in a fresh state and set up almost daily at various bush localities throughout Victoria and NSW (in total over 100 locations), especially in areas of sandy soil and particularly near observed natural populations of *Caleana.* It was hoped that, sooner or later, pollinating insects would be attracted (as it turned out this was to be 'later'). At each location, the bait flowers were placed in vials of water in open places and watched for up to ten minutes. They were often left at these sites for up to 4 hours while other projects were carried out.

During an eight week period from late October to late December, no insects were seen on the flowers and during the long periods they were left unattended, no pollinia was removed from or deposited in any of the flowers. The flowers were set up in a wide range of weather conditions at all times of day and night in heath, woodland, forest or rock outcrop from sea level to 1000 m. Obviously, attracting pollinators to *Caleana* was not a simple task, although admittedly the time spent on actual observation never amounted to more than 15 minutes per day. Previous experience with wasp baiting of other orchids had clearly shown that if pollinators did not appear within a few minutes, later success was unlikely (Bates 1985).

On a hot humid day in late December, three flowers of *Caleana* were set up at 11.00 a.m. on a sandy forest track near Wauchope, NSW. There was a light northerly breeze blowing. After 2 minutes of inactivity, the flowers were shifted to a well-lit clearing. Almost instantly, a fast-flying insect zapped the labellum of one of the flowers. The action was so rapid that only the presence of the struggling insect jammed head first between the labellum and column confirmed that it had happened. The insect was photographed in this position and watched further. Within 60 seconds it had struggled free, taking most of the pollinia with it, smeared onto its thorax. Its take-off was almost as fast as the landing, too fast to allow the hoped-for photograph.

Within seconds, another flower had been zapped as quickly as the first. It was deemed necessary to capture this specimen for identification. The brilliant red and black insect, with its feathery antennae was clearly of the same species as the previous visitor, but not the same individual as it did not have pollinia attached. The sawfly was quickly stunned, then placed on a flower and photographed before being preserved. The duck orchids were then shifted 100 m along the track, where again a fast-flying sawfly (travelling from downwind) hit the labellum of the only flower not previously triggered, its head toward the paler coloured 'beak' of the orchid flower and grasping the red body of the labellum, its momentum swinging this sensitive structure forward and thrusting the insect into the column. This individual had traces of pollinia on its thorax and may have been the visitor previously observed. It was intended to capture this specimen but as the labellum was lifted the sawfly made a hasty escape, but not before depositing pollen on the stigma. As it takes at least fifteen minutes for the sensitive orchid labellum to return to the 'set' position, it was not for some time that further baiting could be tried. When this was done, it failed to attract further insects. The captured insect was later identified by G. Brown (Biochemical and Chemical Research Institute, NSW.) as a pergid sawfly, *Ptery-gophorus* sp.

Although this did not match the determination given by Cady (1965), it would appear from his drawings to have been the same species. A photograph of a sawfly on *Caleana major* was sent to me by D. Beardsell in 1980 (Fig. 1).

Of the many hundreds of *Caleana major* seen in 1987, only three had pollinated flowers.

Summary

There seems little doubt that *Caleana major* is normally pollinated by male sawflies, presumably attracted to the flowers by sexual deception. There is no obvious source of pheromones on a *Caleana* flower, but from the downwind approach of the sawflies, it would seem that some volatile chemical may be released. Pollination by sexually attracted sawflies is apparently unique to *Caleana*, having not been reported for any other orchid. Although the author captured a pergid on a flower of *Caladenia uliginosa* in 1984, it seems unlikely that this was the normal pollinator for that species.

Sawflies are, of course, not true flies, but hymenopterans more closely related to wasps and bees than to any other insect.

The fact that *Caleana* and *Paracaleana* are pollinated by different insect groups lends support to the separation of these two genera. No reasons have been considered for the apparent scarcity of pollination events in *Caleana* or for why it is such a common orchid in some areas despite such low seed set. Certainly the rarity of pollination events would explain the need for the longevity of *Caleana* flowering. Another interesting feature noted was the almost total lack of variation between flowers throughout the range of the species. This is often a feature of flowers in monotypic genera and neatly parallels *Leporella*, another Australian monotypic orchid with a unique pollinator.

A final distinctive feature in *Caleana* which further sets it apart from *Paracaleana*, is the curiously winged or ribbed seed capsule, a character rarely mentioned in the literature.

Clearly, much further research into the pollination biology and ecology of *Caleana* is needed. Remarkably little has been learned in the 100 years since FitzGerald first discussed the pollination of the duck orchids and I would ponder the question whether the 'large fly' reported by Mr. Daintrey (after whom *Pterostylis daintreyana* is named) to FitzGerald was in fact a sawfly!

Acknowledgements

I am grateful to Graham Brown for identification of orchid pollinators and to Leo Cady for discussion concerning his observations of sawflies on *Caleana*.

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BOOK REVIEW

DENDROBIUM ORCHIDS OF AUSTRALIA

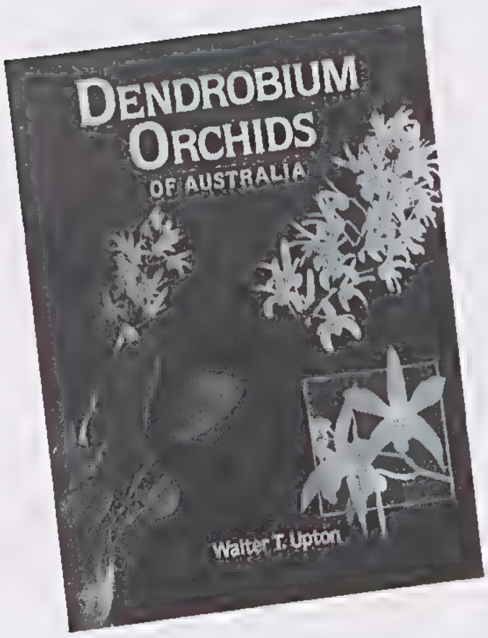
By Walter T Upton. 285 x 208 mm, 237 pages, hard cover, 222 colour plates, 102 black and white line drawings, numerous tables. Published 1989 by Houghton Mifflin Australia Pty. Ltd., PO Box 289, Ferntree Gully, Victoria 3156. Price from $65.00.

In some ways, this book is the story of a three-way love affair: it would not have been possible without the love, understanding and support of Jill and Walter Upton for each other, and of their deep love of native orchids. The author, Walter Upton, is well known on both the national and international scene as a grower and hybridizer of fine Australian native orchids, particularly within the genus *Dendrobium.* He was a foundation member and foundation secretary of our society and has served that organisation at all levels. He is currently our President, and is a past president of the Orchid Society of New South Wales. With this background, Wal Upton is well qualified to write this, the first book to deal comprehensively with the species of the genus *Dendrobium* in Australia.

The book deals exclusively with the Australian members of the genus *Dendrobium.* This genus contains the largest number of non-terrestrial species of Australian native orchids, many of them having large or showy flowers which have attracted the attention of hybridizers. Of all Australia's native orchids, the members of the genus *Dendrobium* have been the most exploited commercially. The timing of this book is therefore very appropriate.

I found the book to be extraordinarily easy to read, and I appreciated the manner in which the information was presented in three ways; firstly in very readable text, secondly as short, well designed tables, and finally in faithfully executed line drawings. Whatever method readers prefer, they will find the message well presented and easily understood. Wal Upton employs a very personal style; he is talking to you, the reader, one-on-one. I found this style very refreshing. He gives his reasons for not following some of the more recently recommended taxonomic changes in concise easily understood arguments.

The book contains a Foreword, Acknowledgements, and Introductory Chapter, seven main Chapters, six Appendices, a glossary, imperial/metric conversion chart, references and selected bibliography, and an index. Within the main chapters, the characteristics, classification and history of the genus *Dendrobium* are described. The individual members of the genus in Australia are then described separately in detail, with information on its history, classification, distribution, habitat, culture, and use in hybridization, along with a line drawing showing the main parts of the plant and flower. Hybridization is treated in detail, describing the natural hybrids that occur in Australia and the history of man-made hybrids using only Australian *Dendrobium* species. Chapters on pollination and seed raising and culture round out the book.



The appendices contain much technical information that will be of value to hobbyists and commercial nurseries alike. They contain information on the main months of flowering in the native habitat, a listing of the *Dendrobium* hybrids using only Australian indigenous parents registered to February, 1988, notes on reclassification of the genus and taxonomic name changes suggested for some Australian members of the genus.

The book contains a great deal of extremely valuable information which is not found in any other single publication. The line drawings alone are a worthy contribution to our understanding of the variation to be found amongst the species of this genus in Australia. I was disappointed, however, to find that there was no table of contents to these drawings and that the drawings were not listed in the index under the entry for each species. Likewise there is no entry in the index to the many colour plates.

Although this is a coffee-table sized book, that size suits the majesty of the subject and the manner in which it has been covered. Amateur and professionals, hobbyists and commercial nurseries, and all serious minded growers and lovers of the genus *Dendrobium* will find this book invaluable. I have no hesitation in recommending that it be in the library of all orchid societies, and in the library of all serious devotees of Australian *Dendrobium* species and hybrids.

Noel J Grundon

"ORCHID GLENN" OPEN DAY & SHOW

Mark A Webb
7 Matthew Parade, Blaxland, NSW 2774

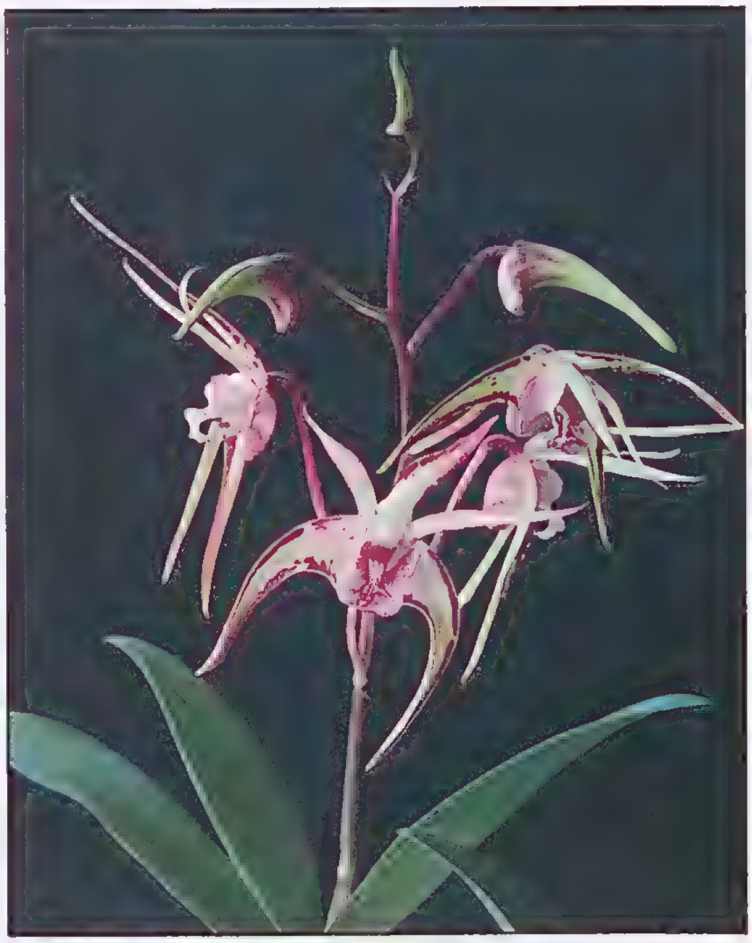
The inaugural Open Day and Show at Orchid Glenn Nursery, Dungog, was privately sponsored by Mr Ken Russell. Ken has been a grower of native orchids for many years and he is probably best known for his line breeding programmes of both *Dendrobium kingianum* and *Sarcochilus hartmannii*. He has also been working on *D. bigibbum* breeding and hybridizing to produce cool growing species and hybrids.

Unfortunately, typical wet NSW weekend weather greeted travellers from Sydney on Saturday the 6th of May, 1989. This was expected and the show had been transferred to the main pavilion of the Dungog Showground. This proved an excellent location in a large, airy hall with more than ample room to admire the many orchids benched. Plenty of food in the form of sausage sandwiches, biscuits, tea and coffee kept those who attended the show well fed all day. The number of attendees was lower than expected due no doubt to the very wet conditions on the road. Strangely enough, we did not get any rain at the show all day after an early shower. Quite a few people did attend from as far afield as Wachope, Wollongong and the Blue Mountains. Devoted orchid growers came hoping to score a prize certificate, or just have a yack with old friends and make a few new ones. I certainly extended my list of orchid friends on the day.

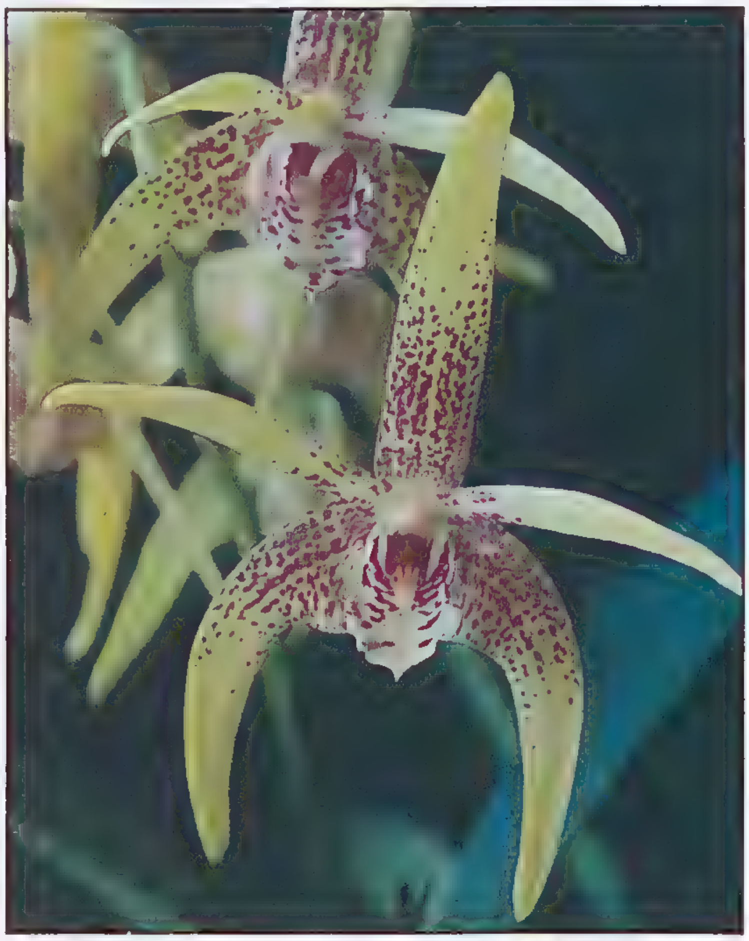
There were a number of classes for Australasian Natives as well as a few exotic classes. Both Orchid Society of NSW and ANOS judges were present and this mixed panel worked well.

An unusual section headed the list, '*Dendrobium* Hybrid with *D.* Ellen as one parent or part thereof'. First place went to a plant of *D.* Ellen x *D.* Carawah grown by Neville Roper, with second also going to a plant of *D.* Ellen x *D.* Carawah grown by Col Brandon. Neville's plant later went on to be judged Reserve Champion of the Show.

Another of Col's plants that caught the eye was *D.* Carawah 'Spot'. This plant, which won section 3, '*Dendrobium* hybrid with *D.* Sunglow as one parent or part thereof', had a single spike of seven well displayed, evenly spaced, spotted flowers. This is another of those hybrids that flowers in both spring and autumn and which we can expect to see more frequently at shows in the future.



***Dendrobium* Ellen x *Dendrobium* Carawah**
***Dendrobium* Carawah 'Spot'**

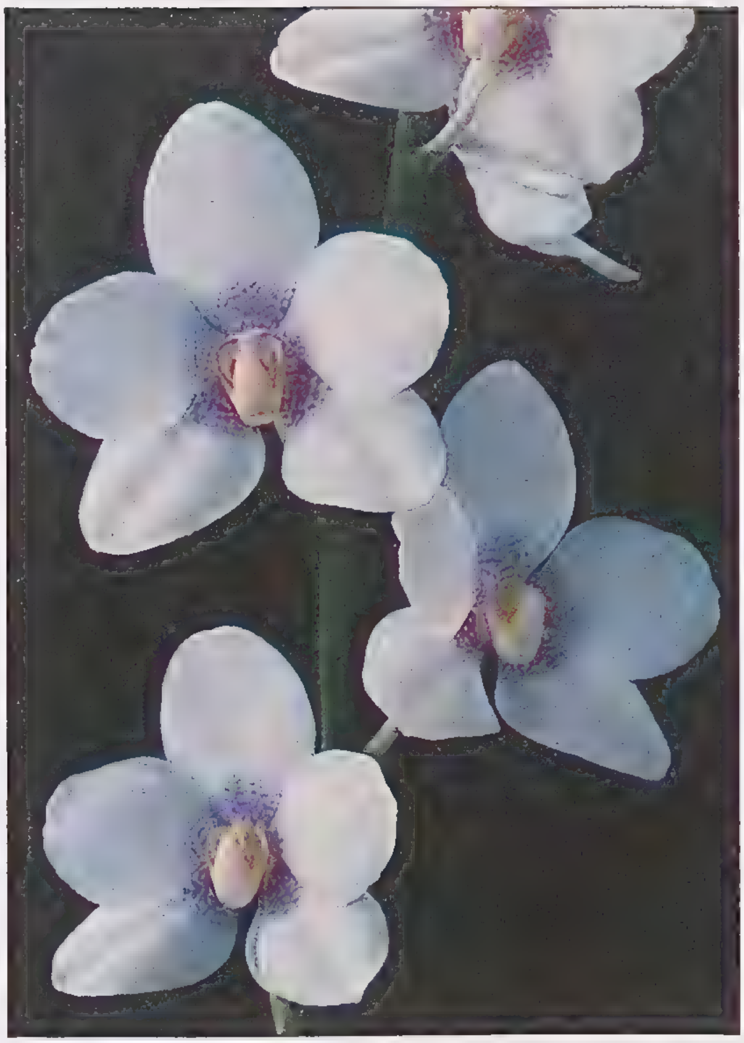


Jumping to Section 7, '*Dendrobium bigibbum*', the most hotly contested at the show we saw some superb clones of this species. Colours ranged from pure white through pale pinks to deep solid dark pinks. The most outstanding plant was a Ken Russell bred seedling, cross #617, grown by Laurie Jarvis. This cross has produced some terrific plants which flower from remarkably small, fat pseudobulbs. All of the plants I have seen are far superior to any *D. bigibbum* collected from the bush. With well filled-in flowers of excellent colour and shape, flowering from compact plants, what more could you want? Second place in this section went to another of Laurie's plants, an albino form of *D. bigibbum*. Laurie used this plant as one of the parents of another winning plant at the show, but more on that later.

Section 5, '*Dendrobium* Hybrid with *D.* Suzanne (formerly *D.* Peewee) as one parent or part thereof', was won by the best *Dendrobium* Elegant Heart I have seen to date, *D.* Elegant Heart 'Jill', was bred and shown by Walter T. Upton. It is a bicoloured form with brilliant cerise tips to the segments surrounding a pale lemon yellow centre. This would have to be without a doubt the most outstanding development in Australian Native Orchid hybridizing to date. This plant was later awarded Grand Champion of the Show.

D. David Baver, made by Laurie Jarvis using his white *D. bigibbum*, was the winner of Section 6, '*Dendrobium* Hybrid with *D. bigibbum* as one parent or part thereof'. By using the 'alba' form of *D. bigibbum*, the dark colour of the *D. johannis* has been allowed to dominate, producing dark plum coloured flowers on long arching racemes. Laurie also took second place in this section with a gem of a plant, *D.* Rosy Tips (syn. *D.* Mini Pearl). Two racemes of dark pink flowers from an extremely small plant were eyecatching. I don't know what Laurie says to his plants but it certainly works.

Both first and second places in Section 9, 'Any Other Native or Hybrid', were taken by Ken Russell with plants of *Sarcochilus* Melba x *Phalaenopsis amabilis* and *Dendrobium* Reg Burns. You have heard me rave about this *Sarconopsis* in last December's issue of *The Orchadian*, so I won't say anymore about this plant, except to mention that it was still flowering from last August.



Sarcochilus* Melba x *Phalaenopsis amabilis

To finish off the day, Ken held a raffle for ANOS, containing some very choice flasks and plants. First prize was won by John Turner of ANOS Central Coast group with second prize going to Bob Smith of Boolaroo Orchid Society. Thank you Ken for this generous donation.

Special mention should be made of the hard work done by Ken who, with his family and friends, worked long, hard hours behind the scenes, peeling kilos of onions, writing signs and organising the food and drink to make sure the day was a success. I would have to say it was the most enjoyable orchid show I have ever attended, no doubt a result of the preparation and the relaxed atmosphere on the day. To those who didn't know or just didn't come you certainly missed an enjoyable, friendly social day with other orchid growers. More shows like this one of Ken's would not go astray, particularly in the quieter times of the year outside our peak show period in spring. It was a great opportunity to see unusual plants without the week after week hassles of spring showtime.

Watch out for next year's show and don't miss it.

FOR EXCHANGE

Will swap young, healthy *Dendrobium discolor* or *D.* X delicatum for plant of *Bulbophyllum minutissimum* or *B. globuliforme.*
R. Harding 2 Pandanus Court, Brunswick Heads 2483 (066) 851977.

BOOKS FOR SALE

All books in good condition.
Australian Indigenous Orchids by A.W. Dockrill
Orchids of Australia by W.H. Nichols
Australian Sarcanthinae by A.W. Dockrill
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W. Skillicorn 6 Thomas St, Gillienston Hts 2321 (049) 328060.

13th World Orchid Conference Group Tour New Zealand, September 1990

A tour to the 13th W.O.C. in September 1990 has been organised for ANOS Group members by ANOS Vice President, Mr Barry Collins.

The tour leaves Sydney on Tuesday 4th of September 1990 with the first night being spent at the Quality Inn, Auckland.

From Wednesday 5th, to Saturday 8th the group will tour some of the most spectacular & beautiful scenery New Zealand's North Island has to offer, including Waipoua Kauri Forest, Cape Reinga, Bay of Islands & Waitangi National Trust.

The evening of Saturday 8th will find the tour back in Auckland ready for the 13th W.O.C. from Sunday 9th to Saturday 15th. Accommodation during this period will be at the Vacation Inn in Logan Park, just 5 minutes from Auckland Showground, venue for the Conference.

Following the closure of the Conference the group will tour further, visiting Waitomo for the glow-worm caves and then on to the thermal wonderworld of Rotorua for two nights, staying at the Rotorua Travelodge (Sunday 16th & Monday 17th).

Following a visit and overnight stay at Tongariro National Park (Tuesday 19th) the tour will travel to the garden city of New Plymouth, dominated by spectacular Mt. Egmont. Two full days will be spent here, visiting the beautiful parks & gardens, including Pukeiti *Rhododendron* Trust, covering 360 hectares. Accommodation for 3 nights will be at the Plymouth Hotel. On Saturday 22nd the tour will travel to New Zealand's capital city of Wellington for two days of sight-seeing, staying 2 nights at the Port Nicholson Hotel.

On Monday 24th September the tour will depart Wellington for Sydney.

Tour Costs per person:

Qantas Airways with Twin share accom. - $1809.
Air New Zealand with Twin share accom. - $1762.

For further information contact Barry Collins at 245 Avoca St. Randwick NSW 2031.
Tel: (02) 398 6448(home) or (043) 88 5761(Berkleley Vale).

WANTED TO BUY

Natural hybrids *D. X foederatum* & *D. X grimesii* plus PNG species *D. lawseii*, preferably other colours than red.
D. Smedley 25B Railway St, Baulkham Hills 2153.

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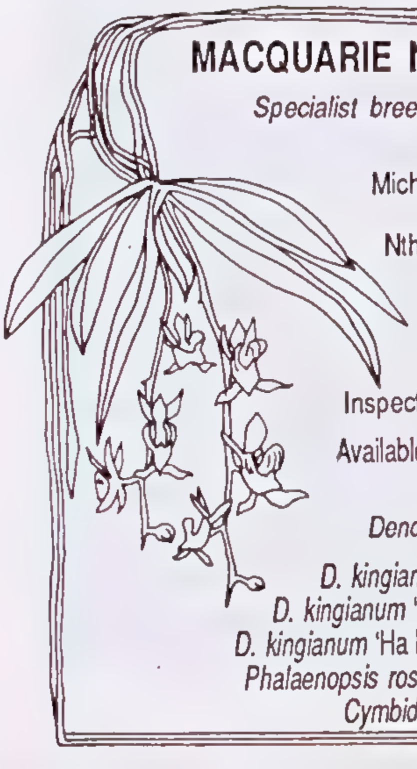

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D. kingianum 'Pigeon's Blood' x self $30
D. kingianum 'Ha Ha' x 'Pigeon's Blood' $30
Phalaenopsis rosenstromii (10 per flask) $25
Cymbidium Little Black Sambo $25

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Please address all correspondance to: **ANOS, P.O. Box C106, Clarence Street, N.S.W. 2000.**

DIRECTORY OF ANOS LOCAL GROUPS AND ASSOCIATED SOCIETIES

QUEENSLAND

- **ANOS Atherton Tableland Group,** Hon. Secretary, P.O. Box 427, Atherton QLD. 4883. Tel: (070) 91 2336. Meetings on the 2nd Sunday each month.
- **ANOS Gold Coast Group,** Hon. Secretary, P.O. Box 582, Palm Beach QLD. 4221.
- **ANOS Townsville Group,** Hon. Secretary, P.O. Box 326, Townsville QLD. 4810. Tel: (077) 78 4311. Meetings 8 pm on 1st Tuesday each month, Townsville Orchid Society Hall, Pioneer Park, Ross River Rd, Kirwan.
- **Native Orchid Society of Queensland,** (Associated Society) Hon. Secretary, P.O. Box 159, Broadway QLD 4000. Tel: (07) 264 3897. Meetings 8pm on 1st Monday each month, Bread House, 49 Gregory Terrace, Brisbane.
- **Native Orchid Society of Toowoomba Inc.,** Hon. Secretary, P.O. Box 5141, Toowoomba QLD. 4350. Tel: (076) 35 8627. Meetings 7.30 pm on 1st Friday each month, Technical & Further Education Centre, Old Empire Theatre, Neil St, Toowoomba.

NEW SOUTH WALES

- **ANOS Far North Coast Group,** Hon. Secretary, 2 Main St, Alstonville NSW. 2477. Tel: (066) 24 1023. Meetings 1st Thursday each month, Ballina High School, Burnett St, Ballina.
- **ANOS Newcastle Group,** Hon. Secretary, 9 Yvonne Close, Belmont North NSW. 2280. Tel: (049) 48 6462. Meetings on 4th Wednesday each month, John Young Community Centre, Thomas St, Cardiff.
- **ANOS Central Coast Group,** Hon. Secretary, 28 Koorabel Ave, Copacabana NSW 2251. Meetings 8pm on 3rd Wednesday each month, Temple Kiely Visitors Centre, Dept. of Agriculture Station, Research Rd, Narara.
- **ANOS Warringah Group Inc.,** Hon. Secretary, P.O. Box 524, Dee Why NSW. 2099. Tel: (02) 99 2468. Meetings 8pm on 2nd Thursday each month, Thomas Vicar Mem. Hall, corner of Pitt & Grainger Rds, Nth Curl Curl.
- **ANOS Sydney Group Inc.,** Hon. Secretary, 51 Waratah Rd, Turramurra NSW. 2074. Tel: (02) 449 9593. Meetings at 8pm on 3rd Friday each month, Lady Game Community Centre, Lady Game Drive, Lindfield.
- **ANOS Port Hacking Group,** Hon. Secretary, P.O. Box 359. Gymea NSW. 2227. Tel: (02) 524 9996. Meetings 8pm on 4th Wednesday each month, Community Hall, Gymea Bat Rd, Gymea.
- **Wollongong & District Native Orchid Society Inc.,** Hon. Secretary, 13 Eleanor Ave, Oak Flats NSW. 2529. Tel: (042) 56 1608. Meetings 7pm on 2nd Tuesday each month, Wollongong High School, Common Room, Lysaght St, Fairy Meadow.

VICTORIA

- **ANOS Victorian Group Inc.,** Hon. Secretary, P.O. Box 285, Cheltenham VIC. 3192. Tel: (03) 583 4278. Meetings 8pm on 1st Friday each month, National Herbarium Hall, Royal Botanic Gardens, Birdwood Ave, South Yarra (behind the Shrine).
- **ANOS Geelong Group Inc.,** Hon. Secretary, Lot 2, Newcombe St, Drysdale VIC. 3222. Tel: (052) 51 3186. Meetings on 2nd Wednesday each month, Fidelity Hall, Star St, Geelong.

SOUTH AUSTRALIA

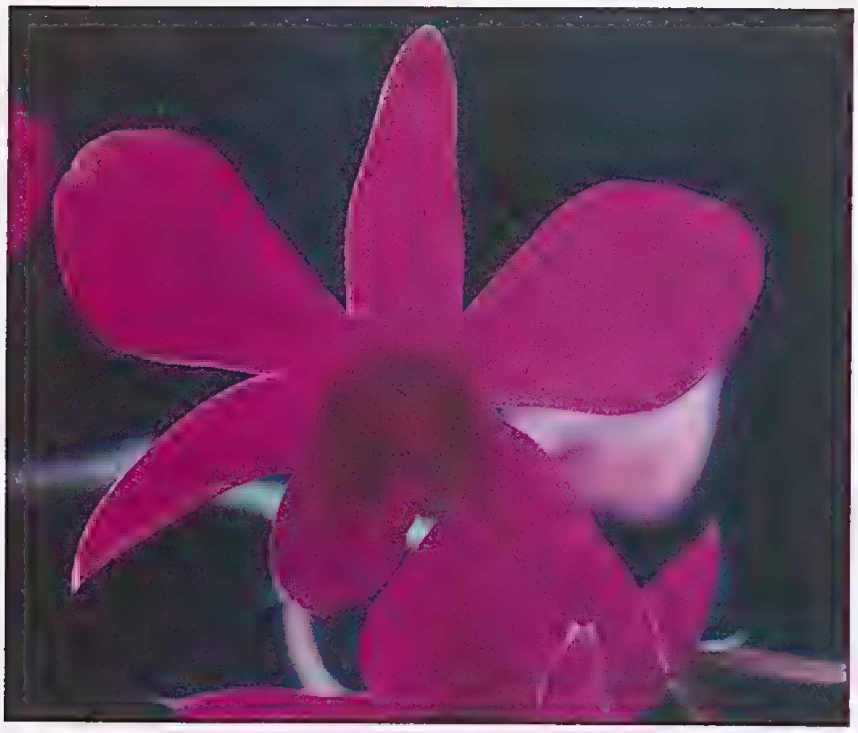
- **Native Orchid Society of South Australia Inc.,** (Associated Society) Hon. Secretary, P.O. Box 565, Unley S.A. 5061. Tel: (08) 278 2917 or 297 3724. Meets on 4th Tuesday each month, St. Matthews Hall, 67 Bridge St, Kensington.

WESTERN AUSTRALIA

- **West Australian Native Orchid Study & Conservation Group (Inc.),** (Associated Society) Hon. Secretary, P.O. Box 323, Victoria Park, W.A. 6100. Tel: (09) 378 1278. Meets on 3rd Wednesday each month, Kings Park Board Administration Centre Theatrette, Kings Park, West Perth.

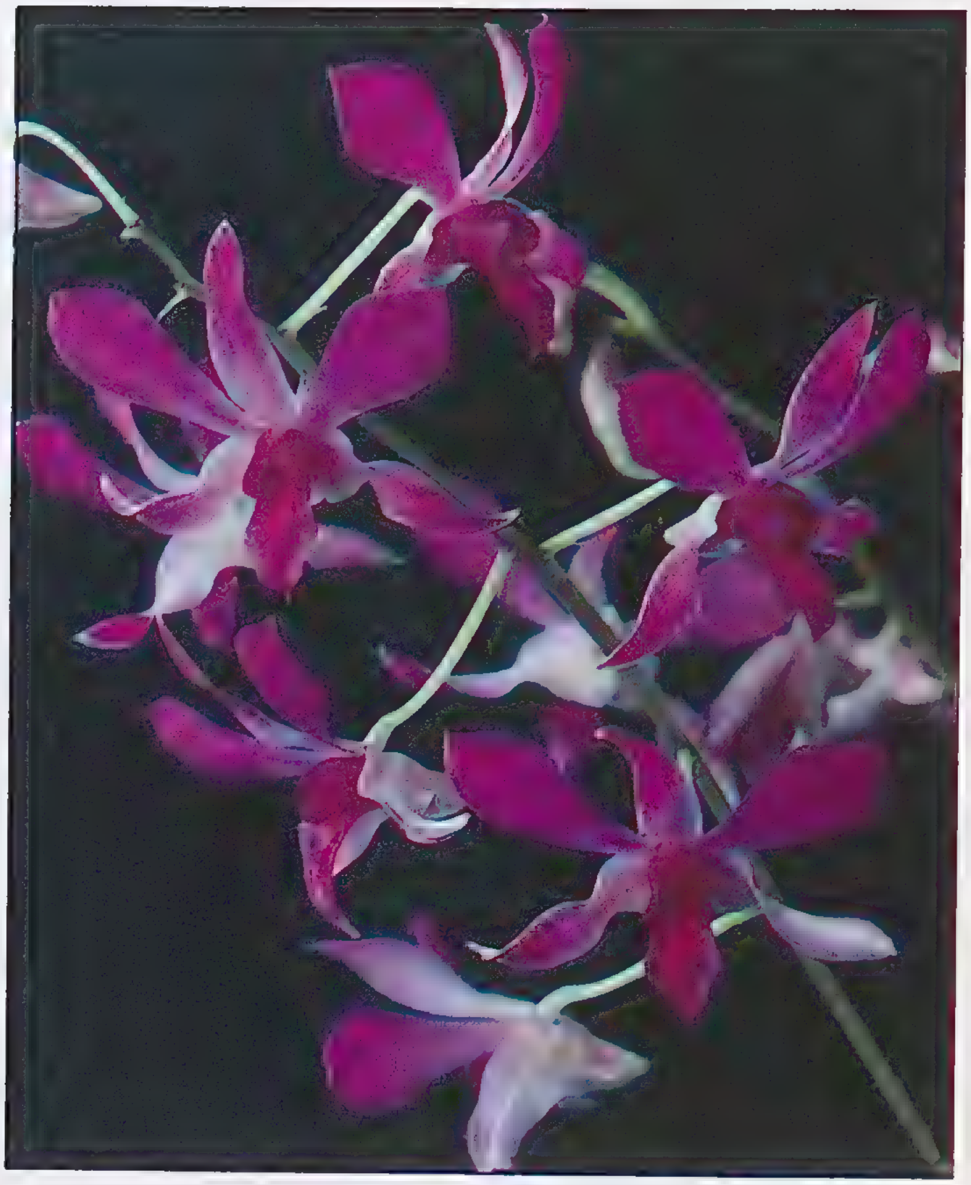
NEW ZEALAND

- **New Zealand Native Orchid Group,** (Associated Society) Convenor, 45 Cargill St, Dunedin, New Zealand.



Dendrobium **David Baver** (See Page 213)
Grower: Laurie Jarvis

Dendrobium **Rosy Tips** (See Page 213)
Grower: Laurie Jarvis



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Phaius tankervilleae (Banks) Bl.

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EDITORIAL

EXTINCTION OF NATIVE ORCHIDS

Many members may have read in various orchid publications of the imprisonment of Henry Azadehdel of Aspley, Nottingham, England, for smuggling and dealing in endangered orchid species. Azadehdel claimed to be an amateur botanist and was well known to many of the world's leading authorities on orchids. He is said to have used information gleaned from these orchid experts to steal endangered species. His persistent questions about the natural habitat of the very rare *Paphiopedilum sanderianum* finally alerted the authorities at Kew who notified Customs. Azadehdel was stopped several times as he returned from Ecuador, Peru and Chile in 1987. Customs found rare orchids in his luggage and documents which related to running an orchid business, including a notebook referring to orders.

Henry Azadehdel was more than a rich hobbyist with a passion for growing rare orchids. He was an orchid smuggler who travelled the world, seeking out the most endangered species to satisfy a cynical desire to own the rare and unusual, and to trade those plants to people who have the same rapacious desires - to own a rare jungle collected plant.

It could not happen in Australia - or could it? Henry Azadehdel is just an extreme example of people who have such a desire to own the rare, the endangered, the exotic, the-only-one, that they will collect even the last surviving jungle plant of a species. We have all heard of fellow native orchid "devotees" who strip the bush of every orchid they can find, boast of the number they have collected, and then promptly kill most of the plants during the reestablishment phase. But far worse still are the people who roam the bush, collecting every plant that is not completely inaccessible, dividing them into near fatally small divisions before packaging them for sale in chain stores and at flea markets.

Greed and personal gain are the biggest dangers to our native orchids in their native habitats; the greed of the people who must possess the largest number of a species or the last naturally occurring jungle collected plants, and the personal gain of the traders who satisfy these greeds.

For readers who feel strongly about the subject of extinction of species, I recommend that you read the article "Conservation minded or narrow minded" by R D Kramer in the October, 1989, issue of *Australian Orchid Review*, and the article in this issue by David Banks, "Line breeding - a big plus for orchid growers and conservation".

There are many legal ways of putting together a high quality collection of species of Australasian native orchids. Seedlings of superior forms are available from many nurseries. Seek out those nurseries, encourage them to advertise their plants as "nursery raised", and spread the whereabouts of those nurseries amongst your friends.

When natural habitats must be destroyed in the name of progress, see if you and your local ANOS Group can obtain permission to remove the orchid flora before destruction of the habitat takes place, and relocate the plants in a safe haven.

Plants raised from seed produced from captive species could also save the wild population from exploitation. Self or sibling cross the species in your own or your friends' collections and supply that seed to the Australian Orchid Foundation Species Seed Bank (see the article on "News from the Australian Orchid Foundation" in this issue).

What we as individuals can do to save an orchid species from extinction may appear small and insignificant compared with the overall scale of destruction of natural habitats, but every little bit adds up to something bigger and necessary if we are to save our native flora.

And remember, when the last of a species has died – we can not make another one!

Noel J. Grundon

Left Page

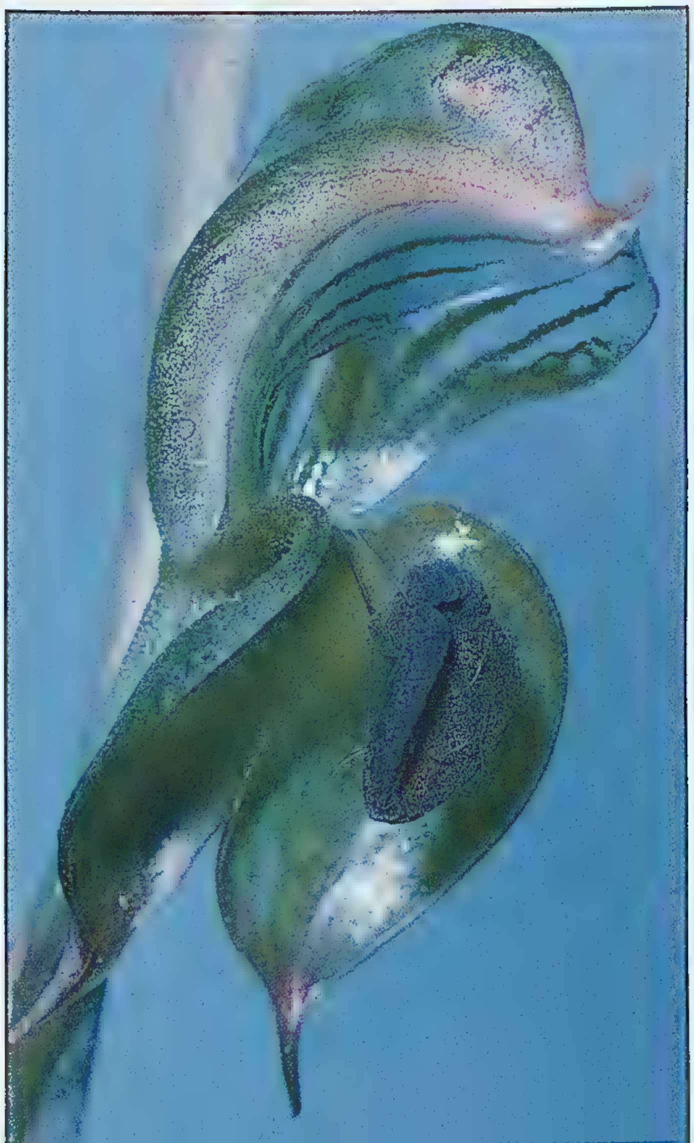
Top left: *Diuris corymbosa*
Top right: *Dendrobium* Taurean
Bottom: *Dendrobium canaliculatum* var. *nigrescens* 'Musgrave Mustard'

Right Page

Top right: *Dendrobium* Impact
Centre right: *Sarcochilus olivaceus*
Bottom right: *Caladenia testacia*
Below: *Pterostylis gibbosa* - a rare terrestrial species from the Illawarra region of N.S.W. is featured as the emblem of the 1st Australasian Native Orchid Conference to be held on 27-30 Sept. 1990 at the University of Wollongong, N.S.W.

Photos by Mark Webb (See pages 222-223).

These colour pictures were made possible by a grant from the Australian Orchid Foundation.



SHOW REPORTS

ANOS SYDNEY GROUP INC.
Spring Show

The sixth annual ANOS Sydney Group Spring Show was a departure from past efforts. For the first time we held our major spring show independently of any other society; we arranged the venue to cater exclusively for ANOS Sydney Group, organised publicity and had total control over all aspects of the show as well as plant sales.

In past years ANOS Sydney Group has been involved with other societies. A number of years ago the annual Mona Vale Show was conducted jointly by Warringah and Sydney Groups and, more recently, our Spring Show was a feature of SGAP's annual Wildflower Show at Castle Hill.

This year, however, we decided it was time to strike out on our own. SGAP were no longer exhibiting at Castle Hill Showground, having moved to Bankstown last year. We preferred to stay in the Hills District, so a show of our own in that region was the logical step. Baulkham Hills Community Centre provided the venue, a well lit, airy hall situated on Windsor Road, just 100m north of the Bull & Bush Hotel.

We held our regular Friday night monthly meeting in the hall setting up the show and by 10:30 that night we knew we had a winner. The benches were full, with some of the lovliest native orchids to be seen anywhere at anytime, and to top that off we had seven entries in the display section a really marvellous effort for our first show in a new venue. As well as our members who mounted displays, a special thanks must go to the S.P.E.C.I.E.S. Society of NSW Inc.. They set up an excellent display, featuring a number of large plants of the spectacular tropical species, *Dendrobium discolor.*

The experienced team of Sid Batchelor, David Butler, Bernie Fletcher and Raydon Rivett arrived with so many plants that they ended up spilling over into the next bay and setting up a second display with their leftovers. Their enterprise was rewarded by 1st and 2nd places in the section, but not as they had expected. Their 'leftovers' exhibit, a cleverly designed and beautifully finished display was judged the winner!

Champion Species of the show was Bernie Fletcher's fine plant of *Dendrobium speciosium* 'Charlie's No.1'. Never an overly floriferous clone of the type variety, *D. speciosum* 'Charlie's No. 1' is nevertheless an outstanding orchid, with widely opening mid yellow flowers averaging about 80mm in height and of excellent texture. Bernie's plant had produced three long, arching inflorescences which displayed their flowers beautifully. A number of other plants of *Dendrobium speciosum* also graced the benches, most notably David Banks' *D. speciosum* var. *grandiflorum* 'Mt. Larcom Gold'. Its colour was outstanding, a deep canary yellow, and the densely packed flowers arranged themselves in clear cut rows along each of the five racemes.

Among the other epiphytic species on show were some very good plants of *D. striolatum* with much larger than normal flowers, a number of well cultured plants of *D. tetragonum* (the so called north coast form) and some lovely pots of *D. kingianum*, including such renowned clones as 'Gloucester No. 4', 'Corrigan's Red', 'Betty' and 'Ruperta'. Darryl Smedley benched a very good form of *Dendrobium canaliculatum* var. *nigrescens* and Gerry Walsh was, as usual, prominent in the *Sarcanthinae* sections, with some excellent *Sarcochilus falcatus* and a very robust *S. olivaceus.*

In the terrestrial species sections Bill Kennewell produced some superbly grown and presented exhibits. His pot of *Caladenia testacia* was lovely, as was his *C. carnea*. He also benched a number of *Diuris*, including *D. platychila*, *D. laxiflora*, *D. alba*, *D. corymbosa* and a fine clone of *Pterostylis gibbosa.* As usual, Jim Lykos also figured strongly in the terrestrial sections and his plant of *Pterostylis gibbosa*, a large flowered form, on an inflorescence nearly 40cm tall, was a real eyecatcher.

In a closely fought contest, Champion Hybrid of the Show was awarded to Bernie Fletcher's *Dendrobium* Taurean (*D.* Hilda Poxon x *D.* Star of Gold). This plant was a first flowering seedling just 100mm tall, and clearly demonstrated the advances being made in native orchid hybridising. It had produced three perfectly erect racemes carrying , respectively, 9, 7 and 5 clear yellow flowers, an excellent effort for first flowering and indicative of the floriferous nature to be expected from this hybrid. The highly scented flowers were widely opening, symmetrical, and in character were mid way between the parents, except for the labellum which favoured the more generous proportions of the *D.* Star of Gold. A further example of the same cross was benched by Robert Lewry and it also was a fine hybrid. Somewhat more bronze/orange in colour, it leaned more towards *D.* Star of Gold in overall appearance.

Another first flowering hybrid benched by Bernie Fletcher was *D.* Star of Riverdene, made using a *D. speciosum* var. *pedunculatum* with *D.* Star of Gold 'Bathurst'. It had an exceptional labellum, wide and beautifully proportioned with the purple splashes of the *D. falcorostrum* still clearly evident on the side lobes. Sid Batchelor's *D.* Aussie Bonanza 'Tammy' x *D.* Star of Gold 'Bathurst' was also a most impressive hybrid, with bronze/orange segments suffused on the tips by dark red, the influence, no doubt, of *D.* Aussie Bonanza.

It is interesting to note that all of the above hybrids were made by Sid Batchelor, using *D.* Star of Gold 'Bathurst'. Sid has used this clone extensively in his hybridising programme and its influence is now being seen. It is responsible for good colour, size and texture in its hybrid progeny and has clearly proven that "quality begets quality".

Sid also exhibited a number of fine hybrids, notably his florific *D.* Hilda Poxon 'Mt. Ida' and one of his newer creations, *D.* Yondi Glow 'Bindi', which clearly carried the influence of *D.* Peach Glow in its peachy colour and thick textured, segments. It was a first flowering seedling and I expect to see a lot more of it in the future. Sid has used his *D.* Peach Glow 'Brolga' in a number of hybrids in recent years and the results are proving to be exceptional.

Norm Biffin's *D.* Kingrose 'Rosebud' was a superb hybrid with beautifully rounded flowers about 25mm across, and the most vibrant and lustrous pink I think I have ever seen in an orchid flower. Norn tells me he has tried to use this clone in further breeding but unfortunately has had no success to date.

Australasian hybrids also made an appearance. First place in this section was *D.* Impact owned by David Banks. The brightly coloured flowers made a stunning contrast to the *D. falcorostrum* and *D. speciosum* plants on surrounding benches.

A magnificent specimen *D.* Bardo Rose was benched by Eric Webeck. It was quite different to most others, in that the pseudobulbs were relatively short, fat and curved upwards. The racemes were more or less pendulous and hung down all around the pot in a delicate curtain effect, the dark pink, widely opening flowers were displayed in a manner quite reminiscent of the exotic species *Coelogyne flaccida*. It was a lovely orchid and a testament to Eric's cultural techniques.

Champion Specimen Plant of the Show was a difficult decision as there were a number of large, well cultured plants, but the judges eventually gave the nod to Eric Webeck's mammoth *Dendrobium X delicatum*.

Beyond the strictly horticultural aspects of the show, the general membership of ANOS Sydney Group showed just what can be achieved when everyone works together towards a common goal. The support given by the members was such that I felt ANOS Sydney Group really has come of age in its approach to conducting an annual show. The atmosphere on the Friday night during the setup was, at times, frenzied, but was always good natured and friendly. It seemed all members were on hand to assist, and during the course of the show, on Saturday and Sunday, we were never left short handed or without back up personel. I extend my compliments to all ANOS Sydney Group members for their support and they are to be congratulated on a very successful Spring Show. Lets do it again next year.

Michael Harrison

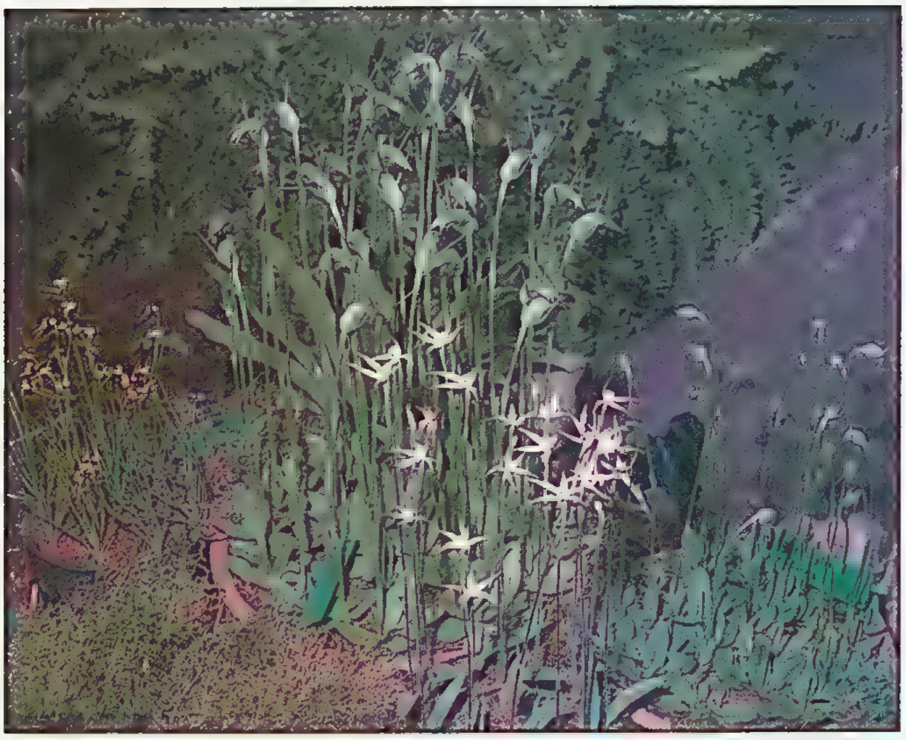
AWARDS NOTICE

Congratulations are in order to Mr Ken Russell of Dungog, for achieving two ANOS awards.

The Stunning plants ***Sarcochilus hartmannii* 'Noelene Red Snow'** and ***Sarcochilus hartmannii* 'Red Snow'** were awarded Highly Commended Certificates (HCC's) at the ANOS Sydney Group Inc. Sarcanthinae Show.

(A full report with photos will appear in the March 1990 *Orchadian*).

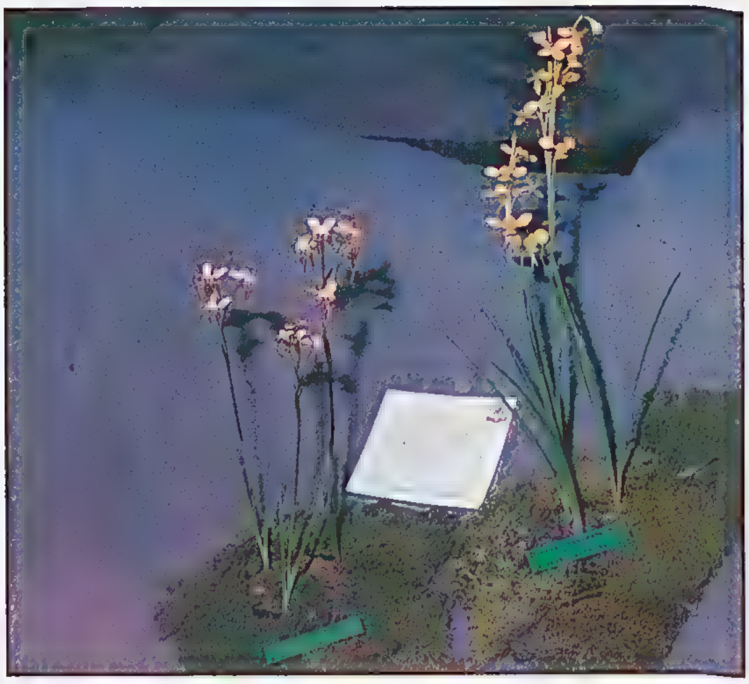
Mark Webb

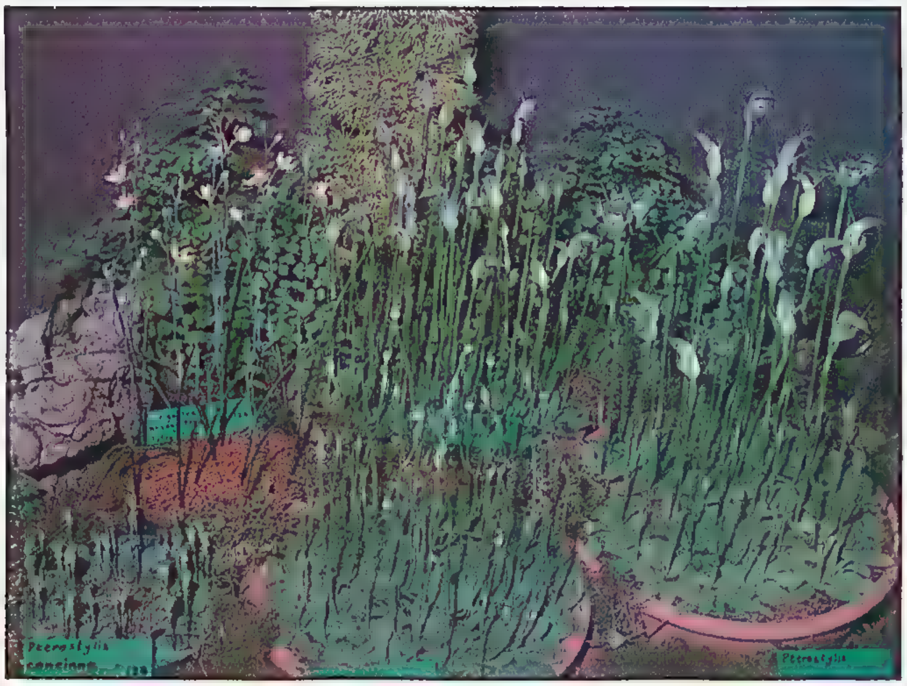


From left to right:

Diuris X palachila
Pterostylis X Ingens
Caladenia Fairy Floss
Pterostylis nutans

Right: *Diuris corymbosa* x *Diuris X palachila*
Far Right: *Diuris lanceolata* x *Diuris citrina*





From left to right:

Pterostylis concinna
Thelymitra antennifera x *Thelymitra luteocilium*
Pterostylis pedunculata
Pterostylis Hoodwink

Photos by R. Hargreaves

3RD ASIA PACIFIC ORCHID CONFERENCE

APOC 3 was held in Adelaide from 31st August to 4th November, 1989. It was run as a combined show featuring the orchids of APOC 3 and those entered in the Orchid Club of South Australia (OCSA) Spring Show. As I grow mainly the epiphytic members of our orchid flora, it was a pleasure to get down into the home country of many of our native terrestrial orchids and see some of the species and hybrids 'in the flesh'. However, the local growers of epiphytes were not put in the shade by the terrestrial growers, as many excellent epiphytic species and hybrids were also on display.

Champion Native Orchid of APOC 3 and first in the terrestrial class of the Open Division of the OCSA Show was *Diuris* Pioneer 'Big Ears' owned by A. Garner. *D.* Pioneer was registered in 1981 by Kay and Les Nesbitt and was the first registered hybrid within this genus. It is an appropriate name for the plant that showed the way forward in hybridisation within terrestrial genera. The prize winning clone, 'Big Ears' displayed the best from both parents. Tall inflorescences up to half a metre carried large, open flowers of dark yellow base colour with an overlay of purple on the sepals. The broad lip was heavily suffused with purple, reminiscent of *D. longifolia.*

Although they missed out on the big prize, Les and Kay Nesbitt swept the pool in other sections of the terrestrial classes of APOC 3. A first flowering seedling of the hybrid between *Pterostylis pedunculata* and *P.* Cutie (*P. baptistii* x *P. cuculata*) won the seedling terrestrial class. The plant was about 15cm tall and carried a single bloom about the size of *P. cuculata.* It was dark green and white in colour. The outstanding feature of this seedling was the black-green colour on the tips of the galea and horns. Best in the specimen section was a well grown exhibit of *Pterostylis X ingens.* There were 37 plants, all in spike, with 33 flowers open. The flowers were typical for this natural hybrid between *P. nutans* and *P. furcata.*

Best terrestrial species was an exhibit of *Diuris palustris* containing 12 plants, 11 of which were in flower. Each plant carried two or three dark yellow flowers which were heavily marked with dark brown on the sepals and labellum. This exhibit was also second in the specimen class.

An exhibit of three seedlings of an unregistered hybrid between *Diuris corymbosa* and *D. X palachila* (*D. maculata* x *D. behrii*) was judged Best APOC 3 Native Orchid and also won first prize in the Terrestrial Hybrid section. Each plant carried up to six flowers which opened progressively, three to four being open at any one time. The lateral sepals and petals were a dark creamy colour with a purple median line. The dorsal sepal was yellow in colour with a purple blush. The lip was small, narrow and red-purple in colour.

Caladenia Fairy Floss (*C. rigida* x *C. latifolia*) came second to the previous exhibit in its class, Best terrestrial hybrid. The exhibit contained 14 plants, 10 in flower with each plant carrying two pale to dark pink, flat spidery flowers about 6 cm in diameter.

First in the epiphytic hybrid class of APOC 3 was *Dendrobium* Ellen 'Pirie' owned by B. Mules. It is the darkest and most well-marked form of this hybrid that I have seen to date, although the flowers tended to be somewhat bunched on the raceme. The pseudobulbs were 15-20 cm high and carried 5-8 flowers per strong, upright raceme. The segments of the flowers were wide, white and heavily marked on the back, margins and tips of the sepals and petals with bright, dark purple. The labellum was wide and solidly marked with purple.

Second to the above plant in this class was another plant owned by B. Mules, *Dendrobium* Aussie Springtime. The upright racemes carried 10-12 flowers with wide segments, basically white in colour with pink markings on the back. The broad lip was white with pale purple markings.

It was disappointing to note that, at the time of judging, a well grown plant of *Dendrobium* Aussie Bonanza was not fully open and so could not be given full credit for its quality. This plant, owned by the Hills family, had 12-15 flowers on arching, somewhat crowded racemes. The flowers were of *D. tetragonum* shape and deep yellow in colour with maroon spotting on the margins and tips of the sepals and petals.

First in the Native Seedling Class of the First Division of the OCSA Show was a plant of *Dendrobium* Aussie Springtime owned by J. and M. Harris. The flowers were white with a typical *D. speciosum* labellum. The racemes were upright and carried 8-10 flowers. From the two representatives of the hybrid *D.* Aussie Springtime I saw in Adelaide I expect it to make a big impression on show benches in the future.

Noel Grundon

FROM THE BACK OF THE BUSHHOUSE

Ian St George
45 Cargill Street, Dunedin, New Zealand.

Ian St. George is the Editor of the Newsletter of the New Zealand Native Orchid Group who are an extremely active group of people involved in the conservation, study, and growth of their native orchids. They love a good bash through the bush, from what I can read in the Newsletter. In his contribution to *From the Back of the Bushhouse*, Ian St George takes us for a ramble through his part of the New Zealand bush – Editor.

I hope I may interpret the title loosely – my fingers never were exactly green, and I have cause to envy the ease with which other people's bushhouses grow native orchids while in mine they fade relentlessly away. So the back of my bushhouse is well out the back of it – in the bush itself, the tussock grasslands, the river valleys, the alpine meadows, the seaside scrub and the native forests of this big (by New Zealand standards), cool area south of the Waitaki River.

Of the hundred or so New Zealand orchids (80 officially, but another 20 are in the pipeline as it were), Otago, Southland and Stewart Island have about 40: five of them epiphytes, the rest terrestrial. On our offshore islands grow the southernmost orchids in the world.

Four years ago I spent a long October weekend trout fishing and attempting to net the wily and elusive whitebait at Martin's Bay, on the west coast, northern Fiordland. This area was settled temporarily last century and a few exotic trees survive in patches around old homestead sites; there are no permanent residents there now. Beside our hut was a very old native kowhai tree, weighed down by fishermen's floats collected by years of visitors along this wild coast. But as well as the floats, the tree supported five epiphytic orchids: *Drymoanthus adversus, Earina mucronata, E. autumnalis, Dendrobium cunninghamii* and *Bulbophyllum pygmaeum.* A few yards away, an introduced sycamore and a macrocarpa supported the same five, a tribute to the very high rainfall (often over three hundred inches in a year) no doubt, but also to the tenacity of these plants.

On the opposite coast, in the east, the land was cleared of forest in early moa-hunter days (and later by European settlers) with fire and the forest survives only in remnants. There are consequently few places where the epiphytes are common and the predominant orchid flora are terrestrials. As everywhere, land clearance and the draining of swamps threaten what survives, but we do have hugh natural areas, either reserved or too inaccessible for intensive pastoral use.

The first terrestrial to appear is *Corybas trilobus*, a tiny *Corybas* with a 1 cm leaf and the elongated sepals and petals common in the New Zealand members of the genus (here "spider orchids" refers to *Corybas* species). My favourite spot is a cold green gorge on the Five Mile Creek near Queenstown, and there, in the skiing season, when the ground is still stiff with frost and icicles rim the waterfalls, *C. trilobus* appears in July. Just a few plants at first, each bearing the green and red flower, but later masses of leaves spread vegetatively. Elsewhere, later, the other *Corybas* make their appearance – *C. macranthus, C. acuminatus, C. rivularis, C. oblongus*. In December, when the drab leaf litter under the Five Mile beeches is warmer, bright pink tiny *Caladenia carnea* flowers appear.

Shag Point is a few miles north of Dunedin, on the coast. Here the endangered yellow-eyed penguin nests, fighting for survival against introduced feral cats and mustelids, in the warm microclimate under tea-trees flattened by the coastal wind. Here too are orchids: several *Pterostylis* species, *Caladenia lyallii* and *C. carnea*, the New Zealand endemic *Aporostylis bifolia, Chiloglottis cornuta*, three *Corybas, Gastrodia cunninghamii* and *G. minor, Prasophyllum colensoi, Microtis unifolia.* Four *Thelymitra* species show here in the summer; *Thelymitra hatchii, T. longifolia, T. pulchella, T. cyanea*, and last summer a new one, similar to *T. decora* but with some differences from the northern forms.

Back to Queenstown. There is a band of Oligocene marine strata that runs diagonally across the province, and elicits surprise from climbers in the Southern Alps when they find fossil fish and shells at high altitude. Near Queenstown the band is an alkaline sandstone, and in the tussock grasslands adjoining it, the wild orchids are thick. Here last year, I found one of our most attractive sun orchids, *Thelymitra formosa*, just a few plants, but far to the south from its previously recognised southern limit. It was a lovely summer down here - the beginnings of the greenhouse effect? Resting my pack in an alpine meadow in the Caples Valley (a beautiful natural garden) a few miles away and a few days later, I became aware that I was sitting in a patch of *Microtis oligantha*, a diminutive plant, distinct from the common *M. unifolia*.

Near Invercargill, last December, the New Zealand Native Orchid Group held one of its field days at the Longwoods Forest - a remnant of dense beech forest, logged early this century, but regenerating; wet, dark, the forest floor covered in thick mosses. Here one can find *Acianthus (Townsonia) viridis*, a tiny terrestrial that we share with Tasmania, the plant 5 cm tall, the leaf less than a centimetre in diameter, the one or two flowers half a centimetre across. The area has a variety of habitats, with about 24 orchid species, from *Lyperanthus antarcticus* in the cold tussock tops to various *Thelymitra* on warm clay roadsides.

They are small and inconspicuous, these southern orchids; a fact affirmed by the frequency of new discoveries. Many of them, like most of the New Zealand species, have at least the potential for self-pollination: in this relatively insect-free environment, there is not the need for large size and bright colours.

Like most terrestrials, they prefer their own habitat, many presumably fussy about their mycorrhizal associations and they do not do well in pots. At least, not for me, but I think I prefer it that way.

NEWS FROM THE AUSTRALIAN ORCHID FOUNDATION

(Assembled from informaion kindly supplied by Mr. Gerald McCraith – Editor)

One of the activities of the Australian Orchid Foundation (AOF) is to provide funds or assistance for various projects that cover a wide field of interests that all deal with orchids. During 1988, they funded the F W Paddock Memorial Research Project where orchid growers were invited to submit ideas for projects on problems that they had experienced with their hobby. The winners in each division were:

Bevan Burchell & Margaret Collins, 82 Kent Street East Victoria Park, WA 6101.
"Deflasking of Thelymitra seedlings"
J W Lampard, 106 Alexandra Avenue, Toorak Gardens, SA 5065.
"Salinity of water supply problems"
Mrs Barbara Walker, 5 Oak Grove, Springvale, Vic. 3171.
"Problems with the Quarantine Procedures"
Mrs Phyl Nicholas, 7 Kelvin Avenue, Moonah, Tasmania 7009.
"Blemishes on certain *Masdevallia* leaves"
Fred W Jones, 48 Waremba Street, Five Dock, NSW 2046.
"Problems with orchid seed pods maturing"
Brian Maxwell, Lot 14, Angela Road, M.S. 250, Rockhampton, Qld 4700.
"The Dendrobium or Orchid Beetle"
D L Benson, 10 Collins Street, Aitkenvale, Qld 14
"Bud drop in the hardcane *Dendrobium*"
Les Higgins, P O Box 110, Wardell, NSW 2477.
"The danger of the Dendrobium midge"

Another activity of the AOF is the selling of seed of orchid species in order to raise funds to support research projects. The operation of the AOF Species Seed Bank serves another useful role in the conservation of orchids species. The importation of orchid species is becoming more difficult and expensive because of various forms of legislation, the depredation of the natural habitat, and the awareness of many countries for the conservation of their orchid species. The question of conservation of the orchid species in Australia is very familiar to orchid enthusiasts. While we have many successful species (if success is measured by the widespread nature of their habitat), there are a number of species whose future is very fragile because of the specific nature of their habitat which is often small in size and may depend on isolation and remoteness for its safety.

The AOF Orchid Species Seed Bank was created to offer a practical avenue for conservation, and in the belief that every effort should be explored to encourage commercial orchid nurseries to raise some orchid species from seed, and ideally, for that nursery to promote their sales as "Nursery raised species". Being practical, the commercial grower would be very interested in those species which may be termed 'very desirable', if the seed is available. The AOF Orchid Species Seed Bank seeks your cooperation to encourage your friends to 'self' a few of these flowers as they come into flower. It is appreciated that the seed cannot be produced overnight. Many of the epiphytes will take 9 to 10 months to mature. While many talk nonsense about conservation, here is a chance for you to do something really positive from the enormous number of very attractive species that have been imported into Australia in the past decades. It is the desire of the Foundation to enlarge the list of seed available for purchase, hence this appeal to YOU personally. Dry seed, rather than green pods is being sought to enlarge the number of species available.

Send seed, and all enquiries for seed to: Mr Erhard Husted, 66 Ethel Street, Sanctuary Point NSW 2540.

LINE BREEDING - A BIG PLUS FOR ORCHID GROWERS AND CONSERVATION

David Banks
183 Windsor Road, Northmead, NSW 2152

Over the last few years there has been a greater commitment to raise large quantities of horticulturally attractive, rare and unusual species from seed. This stems from the fact that wild plants are becoming increasing difficult to obtain from reputable sources; plus there is the knowledge that many 'wild' clones have inferior flowers to those already in cultivation. Plants raised from seed are generally much easier to cultivate than their wild counterparts which undergo a great deal of stress during reestablishment due to damage to the root systems and, of course, change of climate which often proves fatal.

In 200 years, we have seen a number of our plants and animals literally wiped off the face of the earth. Extinct. Gone forever. Who knows how many other species became extinct before they were even described. It is a chilling thought.

As orchid growers, we can play a vital part in endeavouring to protect the very plants that bring us much enjoyment and satisfaction. We can purchase species seedlings from reputable growers at relatively inexpensive prices.

We have already witnessed a dramatic improvement in quality within the exotic species through line-breeding. *Vanda coerulea* from Thailand is a classic example. Today few plants of this species survive in the Thai mountains due to overcollecting. In Australia, vast numbers of fine *Dendrobium kingianum* and *Sarcochilus hartmannii* have been produced from line-breeding and thus quality clones are in most collections. Another positive example is *Sarcochilus ceciliae*, a species relatively uncommon in collections in the early 1980's when one was happy to own a single plant. Today almost all native collections have space set aside for a number of clones - mostly raised from seed. These exhibit larger flowers, larger spikes, richer colours and, most importantly, ease of culture. Even the once rare albino clones are being selfed, further enabling scarce colour forms to be perpetuated.

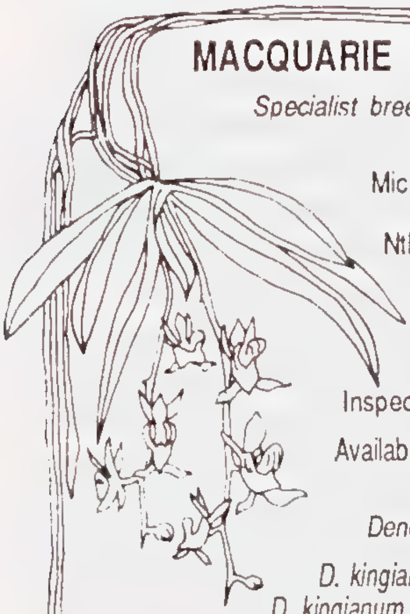
The precedent set by *Sarcochilus ceciliae* is a credit to a number of dedicated growers, including: in New South Wales, David Banks, Sid Batchelor, Neil Finch, Ken Russell, Reg Sheen, Darryl Smedley, Wal Upton, Ben Wallace and Kevin Wilson; in Queensland Warren Dickfos, Ted Gregory, John Roberts, Ray Robinson, Frank Simpson and Dudley Walters; Bruce Mules from South Australia must also be included. No doubt others have shared their concerns.

Much can be achieved from very little. Take the famous example of the Vietnamese slipper orchid, *Paphiopedilum delenatii.* From the original collection only one plant survived, in the collection of Vacherot and Lecoufee in France. They selfed the plant numerous times and made the seedlings available to the orchid world. The rest is history as *P. delenatii* is now a common orchid in collections, all descended from a single clone with the resultant seedlings being far easier to cultivate than the original plant.

The Royal Botanic Gardens, Sydney, is home to the only two known mature plants of *Pritchardia maideniana*, arguably the rarest palm in the world. Thankfully, they have reproduced this frightfully scarce species from seed so its ultimate survival is assured. Unfortunately, volcanic activity and habitat destruction in Hawaii attributed to its extinction in the wild. It is not only Botanic Gardens that can play a part. Each and everyone of us can become involved in active conservation by making selfings or, if possible, sibling crosses, with the resultant seed or seedlings being made widely available. This is important even with difficult to grow species.

Take the example of some of Australia's epiphytic *Sarcanthinae*. First and second generation flask-raised plants of *Plectorrhiza brevilabris, Sarcochilus dilatatus, S. serrulatus, S. minutiflos* (syn. *S. tricalliatus*), *S. weinthalii* and *Schistotylus purpuratus* are now in cultivation with other rarities in the pipeline.

Think about it next time you admire flowering species in your collection. Make hybrids by all means, but make selfing species first priority. Without species we cannot make these hybrids and once the species become extinct we get no second chance. The ultimate conservation of our Australian native orchids is still largely a matter of choice - our choice. Unfortunately, extinction is forever.



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1st Australasian Native Orchid Conference Badge

This badge depicts *Pterostylis gibbosa*, an endangered terristrial species from the Illawarra region of N.S.W. It is the emblem of the 1st Australasian Native Orchid Conference which is to be held on the 27-30th of September, 1990 at Wollongong University, Wollongong, N.S.W.

$5.00 plus $1.00 postage & packaging.

Conservation Badge - 1990

This is the 2nd in the series to aid in the conservation of our native orchids. The featured orchid is *Dendrobium bigibbum* which is threatened, both by overcollection and by habitat destruction. All profits from the sale of this badge will be used for orchid conservation.

$4.50 plus $1.00 postage & packaging.

Both badges are Available from:

ANOS
PO Box C106
Clarence St.
Sydney, 2000

DENDROBIUM MIDGE: A NEW MENACE

Les Higgins,
P O Box 110, Wardell NSW 2477.

(This article was submitted by Mr Les Higgins in response to the Australian Orchid Foundation F W Paddock Memorial Prize. Mr Gerald McCraith, Director of the Australian Orchid Foundation, considered that the information in the article was of such importance to growers of native orchids that it should be published in *The Orchadian.* Mr Ron Kerr suggested that the article should be simultaneously published in both *The Orchadian* and *Orchids Australia* since there is the potential for the pest to infect orchids other than native orchids. Mr. Don Gallagher, Publications Director of the Australian Orchid Council, the owners of *Orchids Australia*, has agreed to publish the article in the December issue of that journal. Les Higgins has accepted these cooperative efforts and I have great pleasure in commending this article to the readers of *The Orchadian* – Editor.)

Introduction

Dendrobium midge has no scientific name. First indications scientists had of its existence came with infested plants from Coffs Harbour in 1985. The plant material has been preserved as part of the Australian National Insect Collection in Canberra.

A small number of midges have been collected for scientific examination. Dr Don Colless, an authority on Australian *Cecidomyiidae*, and now retired, has sent samples overseas in an effort to find the name of the midge. He comments, "There are only a handful of specialists around the world who are really competent in cecidomyiid taxonomy".

The midge is not limited to Coffs Harbour. It has been reported in collections from Nimbin to Gosford, and in bushland around Drake and Tenterfield. It continues into Queensland, having been recorded at Hinze Dam and Tamborine Mountains. Just recently it has been found at Cooktown on *Dendrobium speciosum.* Native orchids on which the midge has been found to date are:*D. aemulum, D. falcorostrum, D. gracilicaule, D. kingianum, D. speciosum, D.* X *delicatum, D.* X *gracillimum*, and *D.* X *suffusum.* Since the natural extent of these plants ranges from north-eastern Victoria to south-eastern Cape York Peninsula, it is important to find out if the midge is present over this entire area.

Each species of the insect genus *Cecidomyiidae* is believed to limit its attack to plant species which have similar texture. Therefore, the suggestion that orchids are damaged by a *Cecidomyiidae* species introduced by CSIRO to control Rag Weed is wrong. The Dendrobium midge will most probably attack dendrobiums only. However, within the section *Dendrocoryne* of the *Dendrobium* genus are species which have an apparently wide variation in texture; *D. kingianum* and *D. speciosum* for example. Therefore, all species and hybrids within that section, as well as intersectional hybrids, could be subject to midge attack.

Description

The adult midge: Adult males and females generally look like mosquitoes. **Head** an intense black colour, round front elevation, rectangular side elevation with rounded top and bottom resembling a sphere sliced through on opposite sides. Simple sucking **Mouthparts**. **Antennae** positioned on the upper part of the head, nine segments carrying the sensory organs. The midge constantly moves the antennae backwards and forwards. **Body** tan coloured with a few scattered black hairs, ca. 4 mm long, width thickens to a little more than 1 mm. **Wings** one pair, silver grey colour sparsely covered with black hairs, span ca. 7.5 mm, lie flat along the top of the body when closed. **Halteres** one pair, paddle shape, tan colour matching body colour, few sparse black hairs. **Legs** six, frail appearance, 5 mm long.

Larvae: Comma shaped, tan colour similar to that of adult insects. **Mouthparts** chewing mandibles. **Body** size dependent upon the instar stage, immediately prior to pupation ca. 4 mm long and ca. 1 mm widest diameter, tapers from head and thorax, apparently 8 segments in the abdomen.

Life Cycle

The egg is laid in a crack or crevice on the surface of the stem. After hatching, the minute larva eats its way into the plant. The entry point is so small that it is not visible to the naked eye. Larvae tunnel indiscriminately in the stem and grow in size through several instar stages. Immediately before pupation, the maggot tunnels to a position just below the outer surface of the stem and chews out a pupating chamber. It pupates with its head towards the outer surface of the stem. Two sharp spines are formed at the head of the pupa. When transformation from maggot to midge is complete, the adult, still enclosed within the pupal skin, uses the two sharp spines to cut the flight hole, then slowly wriggles through until most of pupa is visible. The pupal skin splits and the adult midge emerges. The adult, with crumpled wings, moves onto the stem and pumps fluid from its body into the wings to expand them. When the wings are expanded, the fluid returns to the midge's body and the wings harden. The insect departs, leaving the tell-tale pupal skin protruding from the flight hole.

Symptoms of Infestation

Dendrobium midge infestations appear as pin holes in the stems of host orchids. The holes are flight holes from which the adult has emerged. *D. speciosum* stems are shrunken at the site of the infestation. Small yellow areas may develop where pupae are located. The infested section usually dies. The older canes can be reduced to little more than tubes with walls of tissue paper thickness.

D. kingianum shows three distinct forms of infestation. In the first form, there are only a few flight holes in stems that show no evidence of swelling. The stem may die at or above the flight hole. In the second form, the stem develops a localised swelling, usually in an internodal area or near the apex of the stem. Defoliation can occur. As the stem grows, the internodes become very short. The stem above the flight hole usually dies. In the third form of infestation, the stems develop large swellings, defoliation occurs, and the internodal section may begin to rot. In each of the three forms of infestation, the larvae appear to be restrained within one internodal section.

Research Required

Life cycle: The life cycle of the larvae requires extensive research. Only one observation has been reported: A plant of *D. kingianum* which had grossly swollen and defoliated stems was placed in a sealed insectarium and observed for 5 months. Over thirty maggots in various instar stages were recovered from the rotting internodal section. All the maggots were dead. On the adjoining internode, a tell-tale pupa case appeared five weeks after placing the plant in the insectarium.

The evidence suggests that Dendrobium midge has a long larval life, maybe of up to 12 months, followed by a brief period as a pupa before emerging as a winged adult. Alternatively, there may be two forms of midge life cycle. One may occur during the main infestation period from December onwards when several larva rapidly complete their life cycle. Any plant infested during this period would have insufficient time to react to larvae eating its tissue and so would not form swollen stems; this would describe the first type of symptom seen in *D. kingianum.*

The second form of midge life cycle could be designed to carry the insect over to the next season. In this case, a few slowly developing larvae give the plant time to react and form small swellings; developing symptoms similar to those described above as the second type of infestation. A severe infestation of many slowly developing larvae could cause the whole stem to swell as described in the third form of infestation. One conclusion that can be made is that it is unlikely that an egg would be left vulnerable on a plant for almost one year. It should hatch and the larva find safety within the plant tissue.

Extent of the problem: In bushland, the Dendrobium midge can be considered almost an endangered species. It just manages to survive and infestations are usually only mild. Occasionally, the environment changes to favour the insect and a population explosion may occur. In orchid collections, the environment is far more favourable to a continued infestation. In 1985, there was obviously a large increase in the number of midges in the bush and certain collections became infested as a result of bush collecting. During 1985, an infested stem of *D. gracilicaule* was exhibited at a meeting of the A.N.O.S. Far North Coast Group. No member present at the meeting knew what it was. In 1988, samples of infested *D. kingianum* and *D. X suffusum* were shown to the same group of people. A number of members acknowledged that infestation was present in their collections and could state where similarly damaged orchids are to be seen in natural bushland. The conclusion to be drawn is that the midge is gradually becoming established in collections and has possibly maintained a high bushland population since 1985.

Control methods: Until the life cycle of the Dendrobium midge has been determined, no certain control methods can be suggested. However, scientific publications on the control of other *Cecidomyiidae* can be used as a guide. In 1985, Dr Allan Clift of BCRI published a report on the control of two species of mushroom infesting *Cecidomyiidae.* The report states that one larvae species can penetrate the timber of the growing trays and survive as hemipupae. Larvae inside the timber are difficult to kill with insecticides. In laboratory tests, *Cecidomyiidae* larvae are tolerant of conventional insecticides and disinfectants used for timber preservation. One of the conclusions of this report is that it is difficult to control *Cecidomyiidae* larvae using either insecticides, disinfectants or heat treatment. From Dr Clift's report, it can be deduced that once the maggot enters the orchid's tissue, it is safe. There are no systemic chemicals capable of killing the maggot without first destroying the plant.

There may be two vulnerable stages in the midge's lifecycle. The egg could possibly be killed before it hatches or the adult female could be destroyed before egg laying commences. The ovidipositor is believed to be incapable of piercing the orchid's tissue, so the female midge spends a considerable period of time walking over the plant to determine what cracks and crevices are suitable for egg deposition. While on the plant, the insect is vulnerable to contact insecticide sprays. If wettable powders (WPs) are used, they would accumulate in the favoured egg laying sites and may destroy any eggs also. Of the available WPs, Measurol 75® and Maldison WP250® could be effective. In agriculture, Lorsban® is used to control another *Cecidomyiidae*, the sorghum midge. Lorsban WP is not registered under the Pesticide Act for use on orchids, nor is it really suitable for enclosed structures. It is foul smelling, releases vapour and has an LD 50 rating of 200. However, it is a superb chemical for insect control. If all other WPs fail to control the Dendrobium midge, a permit to use Lorsban not in accordance with the regulations could be requested.

Conclusions

One conclusion of these limited investigations on Dendrobium midge is that it is a difficult pest to control within orchid collections. There is the great danger that it will become widespread throughout collections that contain plants of the *Dendrocoryne* section and inter- and intrasectional hybrids with section *Dendrocoryne* parentage. There is also the possibility that it will infest other members of the genus *Dendrobium*. Five exotic species imported recently from Thailand were found with old infestation symptoms. These species were: *D. capillipes, D. cariniferum, D. harveyanum, D. scabrilingue,* and *D. thyrsiflorum.* There is also the possibility that live insects from overseas populations of the midge could enter Australia and these could be more damaging than the local strains.

ANOS VICTORIAN GROUP INC.

Spring Show 1989

The Victorian Group's annual Spring Show was held over the weekend of the 7th and 8th of October, at the recently renovated National Herbarium building at the Royal Botanic Gardens, an exhausting but satisfying experience for all those who helped, and a huge success!

This year, we decided to keep the display simple and relied on the plants to cast their own magic – it worked! The weather cooperated; the epiphytes were at their peak; and the Herbarium was filled with colour and perfume and looked magnificent. In the centre of the hall, huge specimens of *Dendrobium* X *delicatum, D. falcorostrum, D. kingianum, D. speciosum, D.* Bardo Rose and *D.* Ellen dominated soaring tiers of benches and created waves of colour from pure, crystalline white through palest shell pink to deep pink and vibrant purple and red; from the palest creams and yellows to deep, glowing golds, with smaller plants filling in the gaps.

Each year we find new hybrids being benched and the variety of flower size, shape and colour is little short of amazing. The ubiquitous *D. kingianum* just gets better and better with increased size, substance and colour density ensuring that it will always be popular with native orchid growers; in fact we have several members who have based their collections on this single species.

To the right of the hall were more tiers of benches of epiphytes with hanging plants forming a backdrop. *Sarcochilus falcatus* always looks beautiful; its pure white flowers stand out in glowing relief from the green of its leaves. The delicate, spidery white flowers of *D. aemulum* and *D. linguiforme* contrast in colour with the gold and maroon of *D. tetragonum* while the public wonder over the miniatures of the orchid world, *Bulbophyllum minutissimum* and *D. toressae.*

To the left of the hall more tiers of benches showed off the terrestrial display to full advantage. Each year there are more terrestrials benched, evidence of the "growing" interest in terrestrial orchids. The colours and shapes of these orchids varies greatly and, as the difficulties of cultivation are gradually being overcome, many new species are being benched. It is impossible to choose one terrestrial species as being the outstanding species of the Show. The spider caladenias were, as usual, of great interest, their slender shapes fascinating to the general public. The rich yellows of *Diuris* (the

VALE: MARJ PURNELL

Lyn Verroen.
PO Box 776, Mackay, Qld. 4740.

Mrs Marjorie (Marj) Purnell died at her home in Mackay, North Queensland, on the 6th December 1989, after a long illness. She will be sadly missed by her family and by her many friends in the orchid world.

Marj was born on her parents cane farm at Mt. Jukes, 25 miles north of Mackay, and successfully completed general nursing training at Mackay District Hospital before marrying an Australian soldier she had nursed after he contracted malaria in New Guinea during the war. Marj's husband joined the Department of Civil Aviation and was transferred to New Guinea for 3 years Tropical Service. They stayed for 25 years. Marj nursed at the Anzac Hospital, Lae, where she met Min Korsman. She met Dr. Andree Millar at the Lae Botanic Gardens, and these three formed a lifelong friendship through their love of the New Guinea antelope orchids. With Min and Andree, Marj went on many collecting trips in the highlands of New Guinea. Marj was President of the New Guinea Horticultural Society for many years.

On returning to Australia, Marj 'retired' to Buderim, but found the winters too cold, so returned to Mackay where she decided to breed the antelope orchids. She joined the Mackay and District Orchid Society in November 1973, and held the position of President for 9 years during which time she also was President of the Tropical Queensland Orchid Council. Marj was a life member of the Mackay Society and at the time of her death she was also Patron. Marj was always in demand as an entertaining guest speaker, and she contributed a weekly horticultural article to the local Daily Mercury under the pen name "Ceratobe".

Marj made three trips back to New Guinea to collect selected species which formed the basis of a breeding programme to produce super clones, especially *Dendrobium lasianthera* from the Sepik River area. The evidence of Marj's breeding successes can be seen in orchid houses all over Australia.

The Orchid world has lost a valuable source of knowledge but she leaves a legacy through her breeding lines of the antelope *Dendrobium*.

"donkey" and "leopard" orchids) providing strong contrast to the soft mauve of *Glossodia major* and the pretty pinks and whites of the tiny "finger" caladenias.

ANOS Victorian Group is not a competitive Society but each year, at our Show, a committee is formed to award three prizes.

This year the prizes went to:

The Phil Mims Prize for the Best Cultivated Terrestrial: Malcolm Thomas for his *Caladenia denticulata* (syn. *C. filamentosa* var. *denticulata*)

The Bill Murdoch Prize for the Best Cultivated Epiphyte: Olive Howard for her *Dendrobium linguiforme*.

The prize for the Best Cultivated Hybrid: Alan Webster for his pink *Dendrobium* Bardo Rose.

The same committee selected plants worthy of cultural certificates.

The winners are:

Epiphytes: Frank Date for *Dendrobium striolatum*.
Frank Date for *Sarcochilus hartmannii*.
Olive Howard for *Dendrobium* Warrambool.
Alex Wild for *Dendrobium kingianum*.

Terrestrials: Owen Andrews for *Diuris corymbosa*.
Malcolm Thomas for *Caladenia clavigera*.
Malcolm Thomas for *Elythranthera emarginata*.

In one corner of the hall, opposite the entrance, Cherry Tennant and Helene Wild displayed their artistic talents with some lovely native orchid paintings - the art display is rapidly becoming an annual feature of our Show.

As usual, one end of the hall was given over to plant sales, very popular with the general public who were lined up outside the Herbarium waiting impatiently for the doors to open at 10.00 a.m. on Saturday morning. Two minutes later this area took on the appearance of a bargain basement sale with buyers fighting for their choice of orchid bargains.

It was a magnificent Show and congratulations must go to all those who helped make it such an overwhelming success.

Helene Wild

ANOS WARRINGAH GROUP INC.
Mona Vale Spring Show

The 15th Annual ANOS Warringah Group Inc. Spring Show was held at the Mona Vale Memorial Hall over the weekend of the 9th and 10th of September 1989. The Mona Vale Spring Show is one of the highlights of the native orchid calendar each year. It is an opportunity to see a large hall filled with native orchid species and hybrids in flower, to be overwhelmed by their perfume and to fraternise with people of similar interests.

Displays form a backdrop to any show and there were 4 displays in Section 30, Large Display Section. The display mounted by the Wollongong and District Native Orchid Society Inc. was judged as the best in the section. Tall Australasian dendrobiums formed a backdrop, to a multitude of smaller Australian dendrobiums and a variety of *Sarcochilus* species and hybrids, with terrestrials filling the foreground. The display was finished beautifully and framed with moss covered rocks - a superb display. Second place in this section was awarded to Phil Spence. His display featured many of his latest hybrids with each plant individually featured and well spaced from the next, thus highlighting them. The other displays by Ken Organ, Wollongong and District Native Orchid Society Inc., Reg Angus and myself, were massed displays by comparison.

There is not the time or space to comment on every section but mention must be made of Section 5, Best *Dendrobium speciosum.* Bernie Fletcher won this section with his plant of *Dendrobium speciosum* 'Charlie'. (Another piece of this clone owned by Mr. and Mrs. R. Green was granted an Award of Merit by The Orchid Society of N.S.W. on the 4th September 1989.) Reg Burns was awarded second place for a very floriferous plant of *Dendrobium speciosum* var. *grandiflorum* with deep golden flowers.

There is an increasing interest in Australasian orchids and Section 7, Best Australasian Species, was well represented. *Dendrobium polysema*, owned by Phil Spence won this section. The plant exhibited a straight, upright raceme, and each flower featured a large, broad, red-spotted labellum. *D. polysema* was also judged Champion Australasian Species. *Dendrobium pseudoglomeratum* won second place for its owner Anton van Bysterveld. I anticipate that this section will gain popularity in future years.

The hybrid sections are always well represented and my main interest is Section 21, Best Hybrid Seedling - First Flowering. This section was won by Phil Spence with a plant of *Dendrobium* Emma and Robert Lewry gained second place with a plant of *Dendrobium* Aussie Luck. Both of these plants exhibited large open flowers of good shape.

Table 1 - Winners of the Championship Prizes.

CLASS	PLANT	OWNER
Grand Champion of the Show	*Dendrobium* Rosemary Jupp	Chris Arnott
Champion Epiphytic Species	*Dendrobium canaliculatum*	Mike Harrison
Champion Terrestrial Species	*Diuris punctata*	John Riley
Champion Hybrid	*Dendrobium* Rosemary Jupp	Chris Arnott
Champion Australasian Species or Hybrid	*Dendrobium polysema*	Phil Spence
Champion Specimen Native Species	*Dendrobium aemulum*	Mike Korzenowski
Champion Specimen Native Hybrid	*Dendrobium* Hilda Poxon	A. Sherwood

I would be remiss if I did not mention the terrestrial sections. The terrestrials have been gaining in popularity each year and they were well represented again this year. *Caladenia dilatata*, owned by Peter Eygelshoven, was judged best *Caladenia* species. This plant displayed itself well and caused everyone to pause for a second look. The Champion Terrestrial Species was a beautifully presented potful of *Diuris punctata* exhibited by John Riley.

Dendrobium Rosemary Jupp, owned by Chris Arnott, was judged Champion Native Hybrid of the Show. This orchid was later judged Grand Champion of the Show. The previous weekend this plant was judged Champion Native Hybrid at the ANOS Central Coast Group's Spring Show. *Dendrobium* Rosemary Jupp will be submitted for consideration by the Ira Butler Trophy Committee. Chris grows this plant on a cylindrical hanging mount made from black plastic 'Gutterguard' lined with *Melaleuca* bark and filled with pieces of pine bark. The plant certainly approves of this form of culture judging by the root growth throughout the mount.

A plant of *Dendrobium* Elegant Heart owned by Alan Peck caught my attention. The plant exhibited 6 arching racemes of large flowers, pale yellow in colour with a broad red labelum. This plant was different from the *D.* Elegant Heart exhibited by Wal and Jill Upton at last year's show, and the influence of *D. speciosum* was more apparent.

A number of judges have suggested the addition of a section for Sarcanthinae hybrids which exhibit 'charm'. These small orchids find it difficult to compete when they are judged against the typical larger flowered Sarcanthinae hybrids (eg. *S.* Fitzhart, *S.* Melba etc.). A plant of *Pteroceras spathulatus* x *Sarcochilus* Fitzhart, exhibited by Ken Organ, illustrates this point.

This year ANOS Waringah Group Inc. added two extra championship prizes, Australasian Species/Hybrid and Grand Champion of the Show. (See table 1 for the winners of the Championship Prizes).

In summary, congratulations are due to the show committee, which comprises Chris Arnott, Norm Hilliger, Bob Lowe and Phil Spence, for a job well done. Thanks must also go to all members who assisted with the set-up and manning of the show over the two days. Whilst the show is staged by ANOS Warringah Group Inc, the contributions of the Wollongong and District Native Orchid Society Inc., ANOS Sydney Group Inc. and ANOS Central Coast Group were greatly appreciated. I hope to see you all at Mona Vale in 1990.

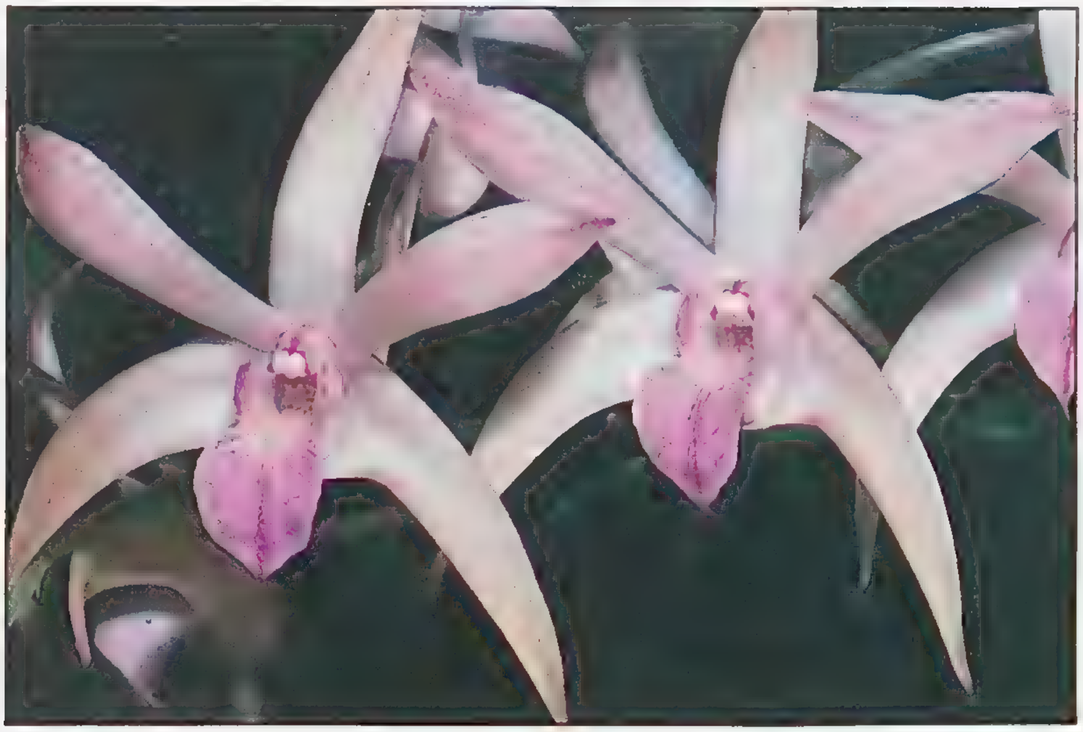
Jim Bailey

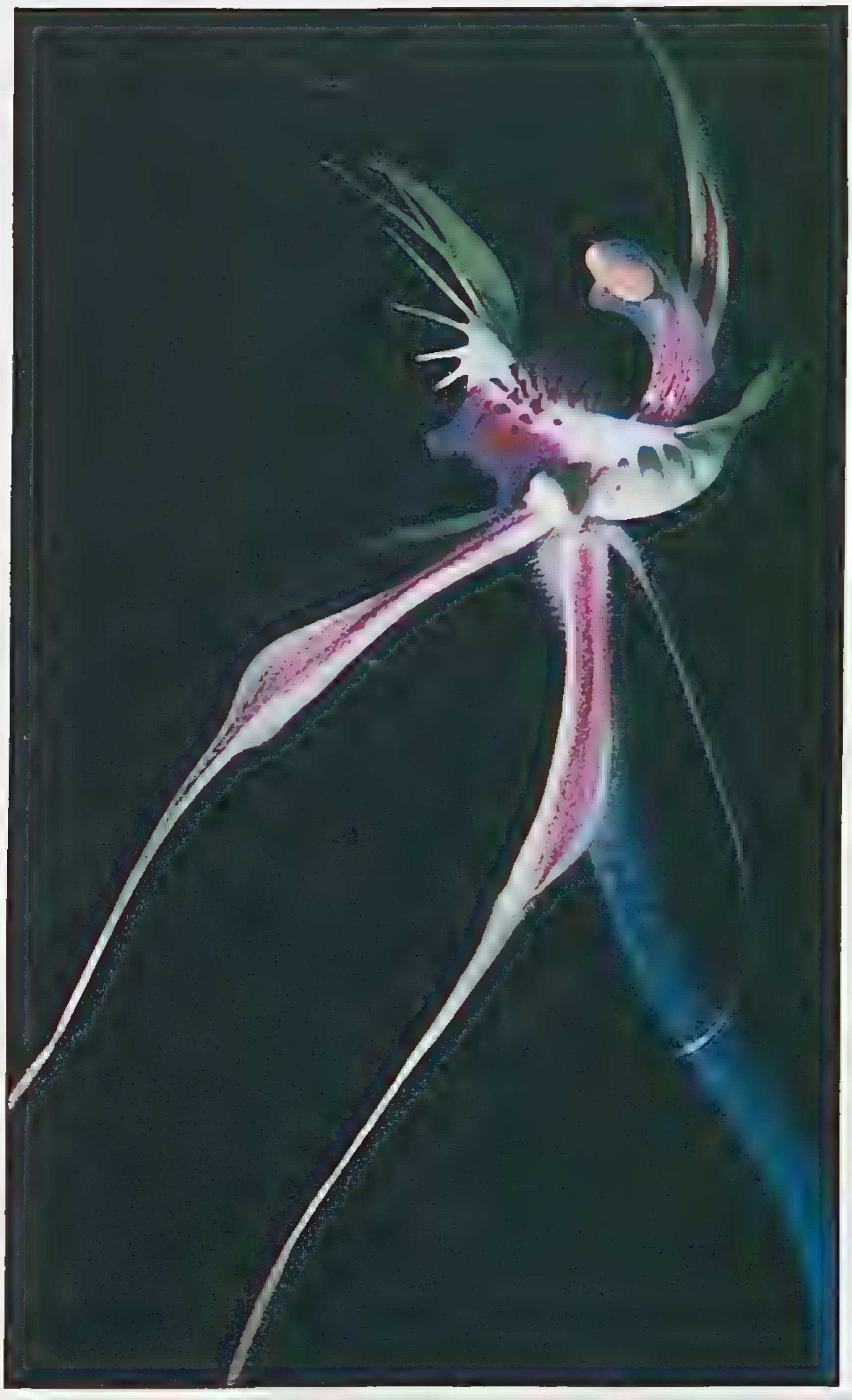
AROUND THE SOCIETIES

ANOS Central Coast Group News

On Sunday November 12th, ANOS Central Coast Group held their annual Trading and Social Day at the Henry Kendall Cottage at West Gosford. Despite the threatening weather, it was a most enjoyable social occasion in very delightful scenic surroundings. The area (2.5 acres) is owned and maintained by the Brisbane Water Historical Society and houses a most interesting museum of early memorabilia as well as the original cottage built in 1836-40, a good sideline of interest should one get bored with orchid friends, if that is possible. The barbecue was a great success with aromas to compete with the best *Dendrobium falcorostrum*, and perhaps more succulent. Trading was brisk with sellers from both the local and Newcastle area. Top native hybrids and species were available in all seedling sizes, as well as in flasks. In addition, pots, chemicals and any other essentials were available. Good conversation, good fellowship, good healthy open air fun, made this day a must for native orchid lovers. If you missed it this year, make it a must next year. See you there.

Walter T. Upton.
PO Box 215, West Gosford, NSW 2250.





Right Page

Top: *Dendrobium* Elegant Heart
Right: *Caladenia dilatata*

Left Page

Top left: *Dendrobium polysema*
Top right: *Dendrobium* Emma
Bottom: *Dendrobium canaliculatum*
var. *canaliculatum*

Photos by Mark Webb (See pages 234-235).

These colour pictures were made possible by a grant from the Australian Orchid Foundation.

Ira Butler Trophy Committee

For the past nine years, trophies have been given by this Committee to orchid growers around Australia for top quality Australian Native Orchid Hybrids, with a special trophy for what the committee has judged to be the best for the year. Nominations for these trophies come from Australasian Native Orchid Society Groups and State Orchid Societies, and are the winners of the Australian Native Orchid Hybrid Section of their Autumn, Winter or Spring Shows. In addition, a plant awarded an F.C.C., A.M. or H.C.C. by a State Orchid Society, by the Australian Orchid Council and now by ANOS Council, may be nominated.

With the nomination, the Society or ANOS group must send three photographic slides showing the whole plant, the view of a flower from the front and one from the side. In addition some written description of flowers is given with measurements of width and or length and in some cases the size of the plant where it is not obvious from the photo. From the slides, the committee judges the plant which is to be the Australian Native Orchid Hybrid of the Year.

All nominations from Shows receive a trophy. This is a silver plaque with engravings of three orchids - a *Pterostylis*, a *Dendrobium* and a *Sarcochilus*, on a wooden base. Below this is a smaller silver name plate showing the name of the plant, the owner and the year. The trophy for the Australian Orchid Hybrid of the Year is larger and gold in place of silver.

And who constitute the Committee? There are three nominees from the Orchid Society of N.S.W., and three nominees from the Australasian Native Orchid Society. The Chairman is chosen by the Committee, is independent of either Society and has a casting vote. The Honorary Secretary is appointed and has no vote on judging matters.

Who was Ira Butler, and why Australian hybrids and not species? These two questions are linked. A quick look at the 'Checklist of Australian Native Orchid Hybrids' shows the name Butler as having registered the following:

Sarcochilus Canary and *Sarcochilus* Fitzhart in 1963, *Sarcochilus* Phyllis, *Rhinochilus* Dorothy and *Rhinochilus* Rona in 1965. In 1966 comes *Sarcochilus* Lois and *Sarcochilus* Melba. *Sarcochilus* Gwen and *Sarcochilus* Mavis came in 1969 and in1972 *Sarcochilus* Southern Cross and *Parachilus* Perky were registered. After that nothing from Butler, but hybridizing has taken off until in the eighties there is an explosion of registrations from hybridisers such as P. Spence, W. Upton, D. Cannon, N. Jupp and now S. Batchelor, K. Russell and D. Banks, to mention a few.

Thus, Ira Butler may be considered the father of *Sarcochilus* hybrids and intergenerics. Unfortunately, in 1972 he suddenly died while only in his middle sixties. This was a great shock to his family, friends and to the orchid growing fraternity.

Early in 1974, a subcommittee of ANOS consisting of the late Eric Gordon, John Stuart, Murray Corrigan and Phil Spence was set up to stimulate and encourage the advancement of Australian Native Orchid Hybrids and so to continue the work of Ira Butler. By the end of 1974 the committee consisted of 7 elected members, A.B. Porter, W.T. Upton and Athol Bell from the management Committee of the Orchid Society of N.S.W., and Eric G. Gordon, President of ANOS, Phil Spence and Murray Corrigan, both ANOS Councillors. The seventh member was John Stuart, a well-known orchid grower on Sydney's North Shore and a good friend of Ira's, as the independent Chairman. This position he held until March 1989 when he resigned. Keith Irvine was then elected Chairman. Murray Corrigan is still a very active member of the Committee.

It took a number of years to get the Committee established, to find finance, and to decide what form the trophies should take. In 1975 an Ira Butler Achievement Trophy was offered, and nominations were called for. In 1976 both W. Upton and R. Bedford received these trophies for outstanding work in hybridisation of Australian Native Orchids.

Why did Ira make his hybrids, and why the genus *Sarcochilus*? Those questions are linked to the nature and philosophy of the man himself, a remarkable man of many parts. They are worthy of further investigation and another article.

Ruth Rudkin

Trophies Awarded for 1989

This year 18 nominations were received from ANOS groups, State Orchid Societies and Orchid Councils. The standard of entries has continued to be high, but some of the photography could still be improved. Remember judging is based on the slides received. The entries were:

ANOS Central Coast Group	
Spring Show - *Dendrobium* Rosemary Jupp	C. Arnott.
ANOS Far North Coast Group	
Spring Show - *Dendrobium* Ellen	H.G. Young.
ANOS Sydney Group Inc.	
Spring Show - *Dendrobium* Tarean	B. Fletcher.
Sarcanthinae Show - *Sarcochilus* Jewell	S. Batchelor.
ANOS Waringah Group Inc.	
Spring Show - *Dendrobium* Rosemary Jupp	C. Arnott.
Native Orchid Society of South Australia Inc.	
Spring Show - *Dendrobium* Sunglow x self	B. Mules.
North Moreton Queensland Orchid Council	
Charity Orchid Spectacular - *Dendrobium* Gloucester Sands	H. & L. Appel.
Orchid Club of South Australia	
Autumn Show - *Pterostylis abrupta* x *Pterostylis rogersii*	L.T. & M.K. Nesbitt.
Winter Show - *Dendrobium* Blushing Sun	R. & P. Rankin.
Spring Show - *Diuris Pioneer* 'Big Ears'	A. & D. Garner.
Orchid Society of N.S.W. Inc.	
Winter Show - *Dendrobium* Hilda Poxon	S.R. Elliot.
Spring Show - *Dendrobium* Bardo Rose	P. Spence.
Orchid Society of W.A.	
Winter Show - *Dendrobium* Hilda Poxon	F. & H. Patfield.
Spring Show - *Dendrobium X delicatum*	G. & A. Hansen.
Queensland Orchid Society	
Dendrobium Our Native 'Sunshine Coast' A.M. (QOS)	L. Grubb.
Tasmanian Orchid Society	
Spring Show - *Dendrobium* Hewitt Glow 'Bronilyn'	J. & B. Smith.
Wollongong and District Native Orchid Society Inc.	
Spring Show No. 1 - *Dendrobium* Dainty Cascades	S. & C. Popple.
Spring Show No. 2 - *Sarcochilus* Melba	R. Wheldon.

Once again all entrants are to be congratulated on the standard of their entries. New hybrids and remakes of old hybrids are ensuring a steady improvement each year.

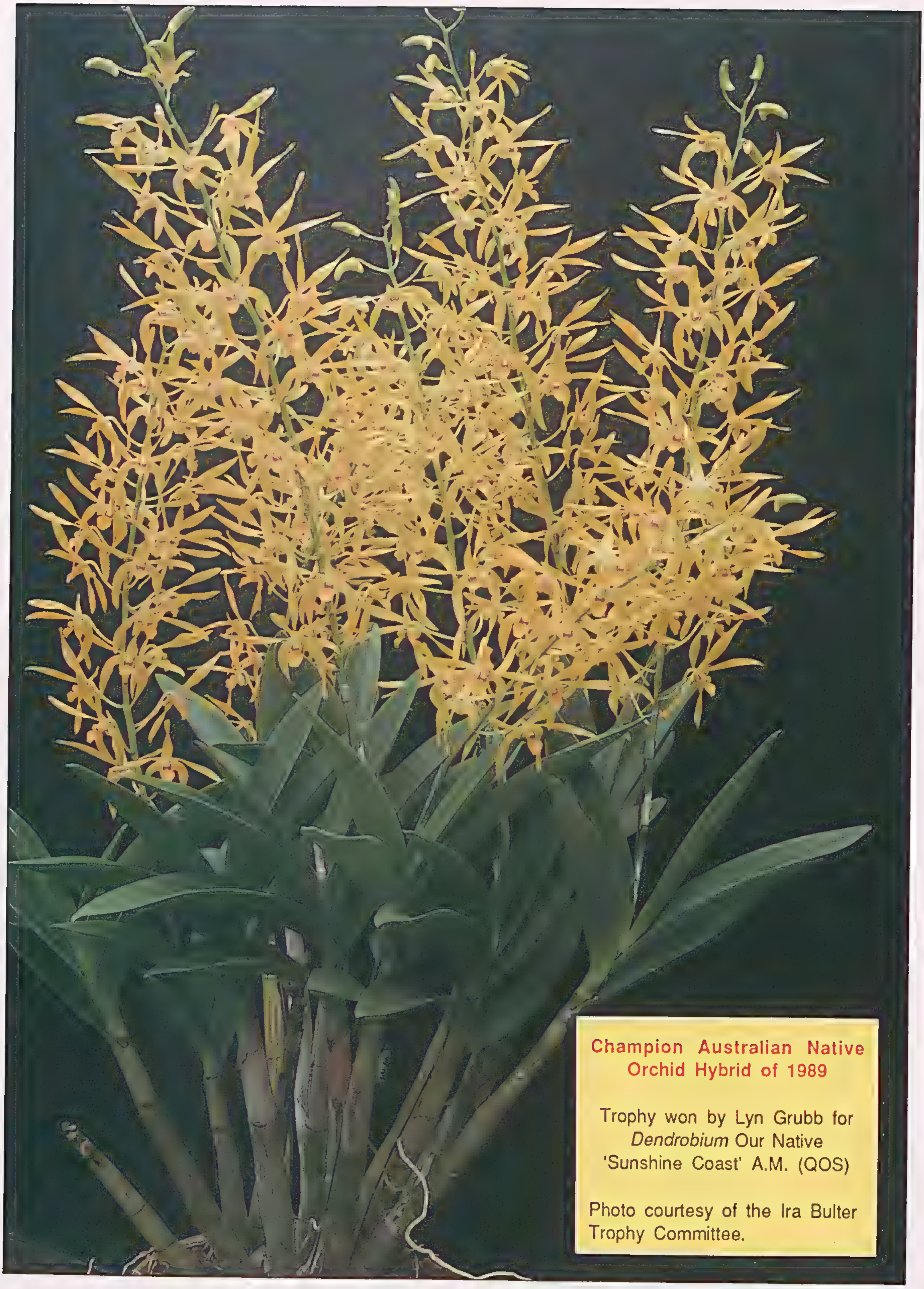
It should be noted that Mr. S. Batchelor, who is an ANOS representative on the committee had a plant to be judged, so he disqualified himself and abstained from voting.

Trophies will shortly be dispatched to Society secretaries, or in the case of NSW Groups and the O.N.S.W. presentation dates may be arranged.

Nomination forms for 1990 will be sent to all ANOS groups and Orchid Societies in April 1990. Hopefully, slide sets of hybrids will be made available during the year.

We thank you for your participation in our efforts to save orchids in the bush by encouraging the growing of beautiful hybrids.

Ruth Rudkin
Honorary Secretary,
on behalf of the Committee.



Champion Australian Native Orchid Hybrid of 1989

Trophy won by Lyn Grubb for *Dendrobium* Our Native 'Sunshine Coast' A.M. (QOS)

Photo courtesy of the Ira Bulter Trophy Committee.

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Phaius tankervilleae (Banks) Bl.

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EDITORIAL

THE GREEN REVOLUTION

Being a person with a background in agricultural science, the words "The Green Revolution" bring memories of the general feeling that abounded in the 1960's that we would be able to feed the world's exploding population when the new high-yielding crop varieties were distributed throughout the developing countries where population pressures and lack of food were greatest. During the 1970's, we found that the new high-yielding varieties needed high inputs of fertilizers, pesticides and insecticides to achieve their high yields, and that this technology was only possible in the developed countries; farmers in many developing countries could not afford the cost of high inputs of fertilizers, insecticides and pesticides. As a result, the 1980's saw a large increase in food production in the developed countries of eastern Europe, North America, and Australia, together with an increase in pollution of the air and above and underground waters from industrial development, over-fertilization of crop land, and over-clearing of land for cropping purposes. At the same time, we have seen some of the worst famines and soil erosion in developing countries brought about by over-population, over-clearing of land for fuelwood and cropping purposes, and over-stocking for livestock enterprises.

Today, in the 1990's, the words "The Green Revolution" have a new meaning, especially in developed countries. Save the forests! Plant a tree! Stop the logging! More national parks! The Green Party! The Greenies are elected to parliament! Conservation is on the march!

I believe that the 1990's will see more concern for the natural and our built-up environment by the general public. Careful, truthful, non-sensational education of the general public is needed if we are to succeed in our attempts to improve our built-up environment and, at the same time, conserve sufficient of our natural environment (i.e. the bush, the sea shores, the rivers, etc.) to allow all plant and animal species which are alive today to continue to live in their native habitats. A zoo or a bushhouse is not a substitute for the natural environment; it is an admission of failure on our behalf if we must resort to housing the last of a species in a captive environment just to save it from extinction.

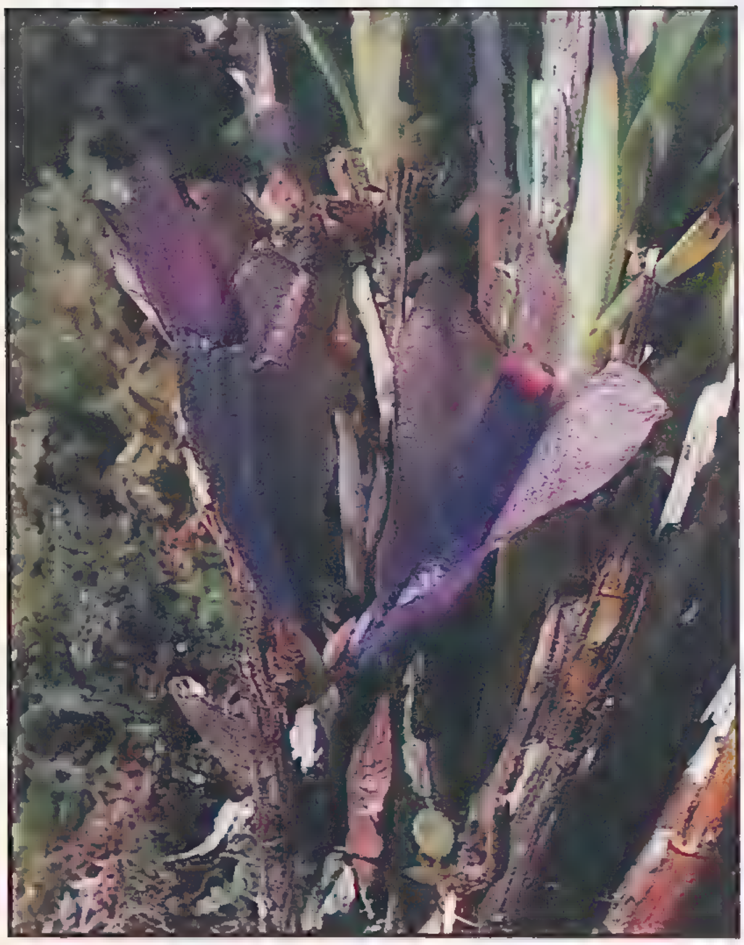
I am aware that I have used this page in the past to express my thoughts on conservation, and that I have included articles on the general theme of conservation in previous issues of *The Orchadian.* I make no apology for this; I publish what the authors send me, so there must be a number of native orchid growers who are concerned about conservation.

In this issue, Brian Pepperall, the AOC Conservation Coordinator, tells us what is happening on the national front through the Australian Orchid Council to try to coordinate the effort to save native orchids. John Roberts brings to our attention how the habitats of native orchids in his area are being destroyed by introduced weeds and the activities of mankind.

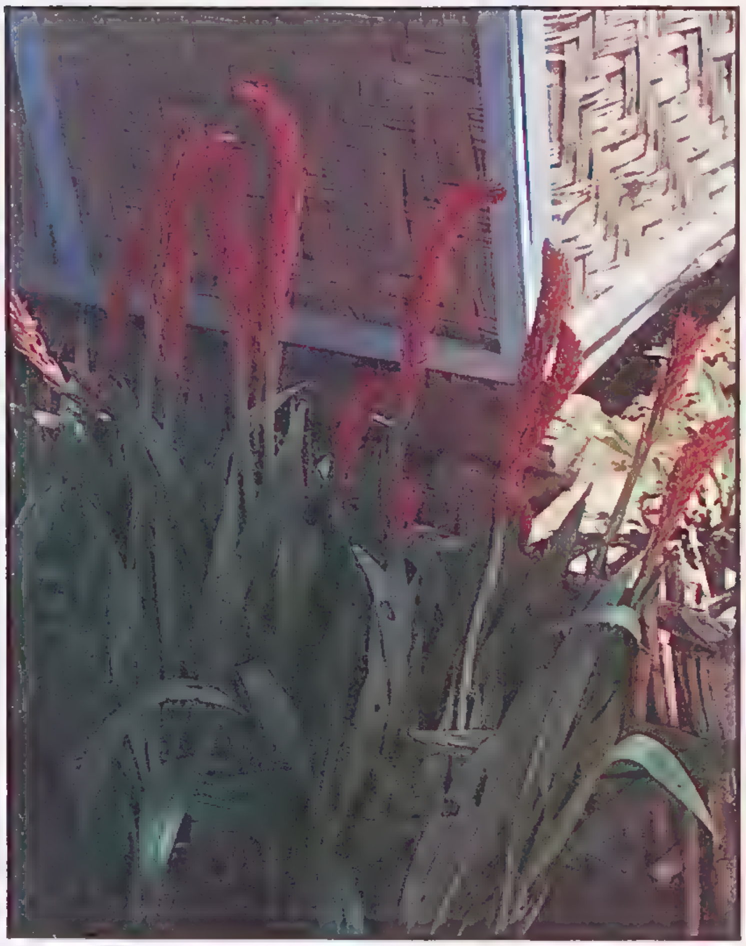
In a future issue, we will hear from Graeme Bradburn, ANOS Conservation Officer, on the work being done through our own organisation. But what are you doing? You could start by reading some of the back issues of *The Orchadian* where many good ideas have been put forward on conservation of our native orchids.

"The Green Revolution" not only means that you and everybody else on this planet has enough food to eat, but also means that we must find ways of producing that food and maintaining our lifestyle without destroying our natural and built-up environment.

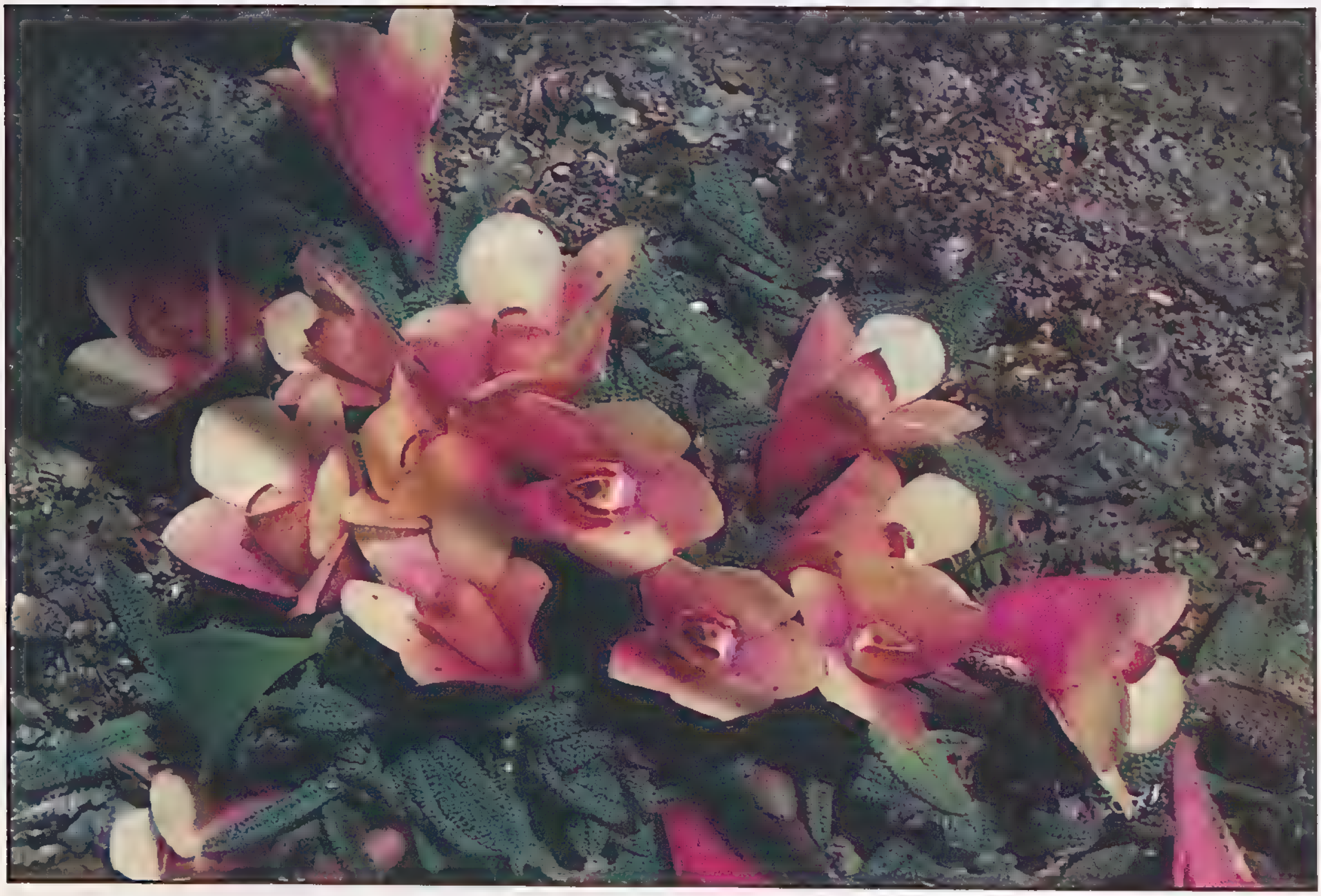
Noel J. Grundon



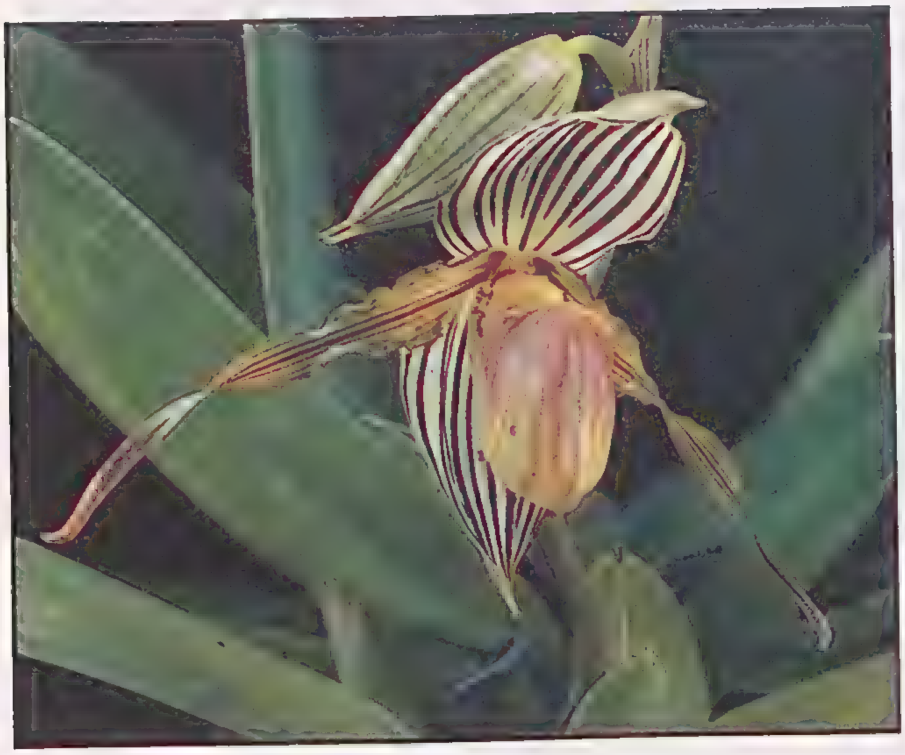
Dendrobium vexillarius J.J. Sm.
Photo by F. Featherstone. (See page 246.)



Lepidogyne sceptrum Schltr.
Photo by T.M. Reeve.(See page 246.)



Dendrobium cuthbertsonii F.Muell. 'in situ'. Photo by F. Featherstone. (See page 246.)

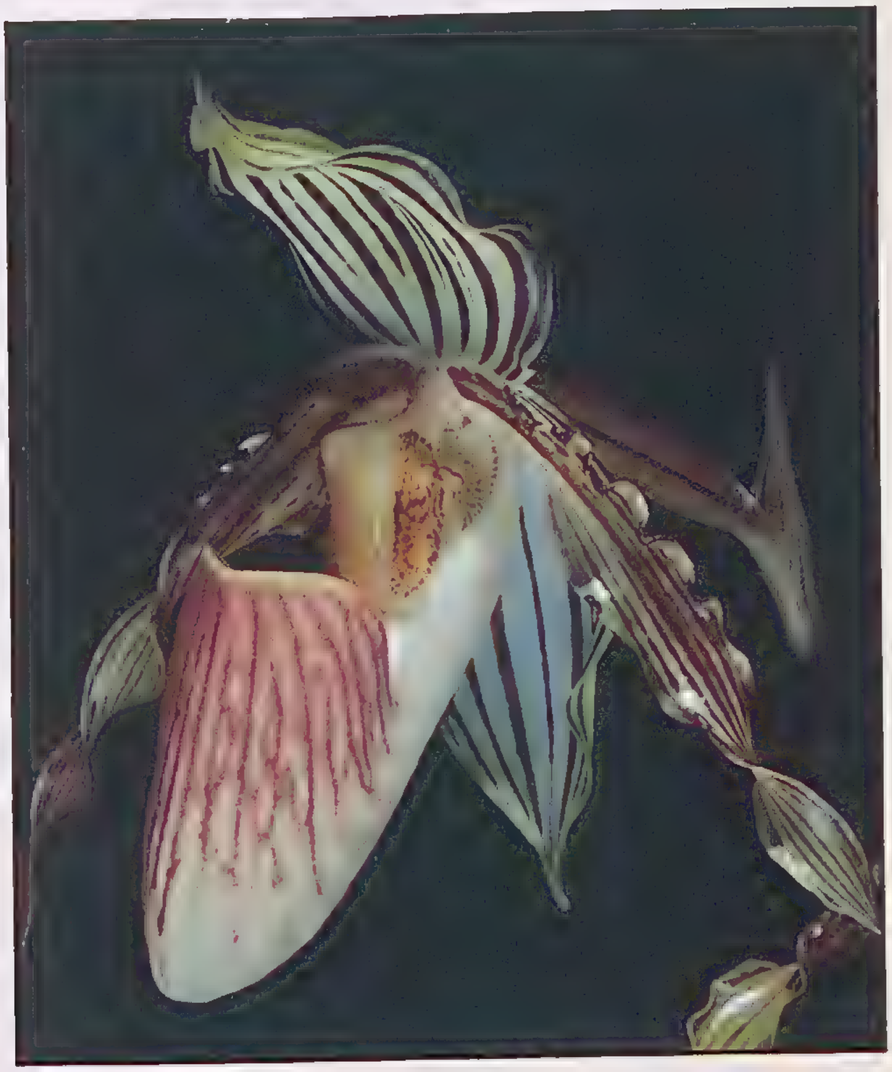


Left: ***Paphiopedilum glanduliferum* var. *wilhelminae*** (L.O. Williams) Cribb - differs from var. *glandiliferum* in that it has shorter leaves, smaller flowers and is often missing the warty glands on the petals. The staminode is more compressed than the type variety.
Distribution: Between 1700 -1800m, in the highlands of New Guinea.

Photo T.M. Reeve. (See page 246).

Right: ***Paphiopedilum glanduliferum* var. *glanduliferum*** (Blume) Stein - One of the earliest described tropical *Paphiopedilum* species, by Blume in 1848.
Distribution: From sea-level to 200m, in Eastern Indonesia and New Guinea.

Photo by M. Webb.



ORCHIDS OF MOUNT GAHAVISUKA – PART 4: THE TERRESTRIALS

Norman E.G. Cruttwell.
'Calanthe', P O Box 961, Goroka, EHP, Papua New Guinea.

This is the last of my 'quadrilogy' of articles on the highland orchids of Papua New Guinea, with special reference to Mt. Gahavisuka Provincial Park and the Lipizauga Botanical Sanctuary. The first is a natural nature reserve and the second a sort of botanical garden for native species, included in the Park, but limited to a defined area. So there are many highland orchids in the Sanctuary which do not actually belong to the local habitat. They are in fact '*ex situ*'. I shall include all of these in my article as all come from the same type of environment, namely mid-mountain rainforest and associated grasslands.

Orchids Do Not Keep to Rules

Orchids are like human beings, they do not always keep to the rules. You will often find terrestrials growing as epiphytes and epiphytes as terrestrials. Some, like *Dendrobium terrestre*, can not make up their minds which they are and occur equally frequently as either type. Two dendrobes, *D. prostheciglossum* and *D. pleianthum* are nearly always terrestrial, but occasionally climb a tree. In alpine habitats, species which are normally epiphytic become terrestrial, because there are no trees to grow on and the deep layer of peat and humus provides an epiphytic type of habitat. They do not really grow in the ground at all. In this habitat, they tend to become stunted with exceptionally large and brilliant flowers. I have seen very fine red forms of *D. vexillarius* (syn. *D. uncinatum*) and orange and yellow *D. subclausum* (syn. *D. phlox*) on Mt. Dayman. Many epiphytes as well as terrestrials will grow on damp rocks, as well as on steep banks and road cuttings. *D. cuthbertsonii* (syn *D. sophronites*) is often to be found in such locations, usually with a single brilliant flower shouting its presence to the passer-by. The beautiful little Section *Calyptrochilus* plant, *D. vannouhuysii* actually creeps along the ground in mossy bogs, bearing bright red single flowers with a yellow labellum.

Although the majority of orchids in the tropics are epiphytes, there are quite a substantial number of true terrestrials with their roots firmly in the ground. I will now describe these. Many of the genera and some of the species are to be found in Australia, and should feel more familiar to Australian readers, but not the first.

The 'Slipper Orchids': *Paphiopedilum*

These marvelous members of the great tribe of *Cypripediinae*, found world-wide, but not so far in Australia, are completely fascinating because of their large waxy flowers of unusual shape, with the great slipper-like labellum designed to trap insects and only release them when they have done their pollinating work. They have always been popular with orchid cultivators. We have two main species in Papua New Guinea*. They are mainly lowland plants but *P. violascens* and *P. glanduliferum* (syn. *P. praestans*) do extend into the southern Highlands, reaching an altitude of some 1800m. I have planted both in the Sanctuary, but *P. violascens* has not survived, and *P. glanduliferum* has not flowered. I think we are too high (2500m) for them. *P. violascens* has marbled leaves and a single flower and *P. glanduliferum* shiny green leaves and three or four flowers per scape. The colourings are too subtle to describe briefly. The grow on volcanic or limestone rocks only, *P. violascens* in the forest and *P. glanduliferum* in more open habitats.

The Habenarias and Goodyeras

I am taking this designation very broadly to cover a whole group of smaller terrestrials of the forest floor. Habenarias are rather few and far between, with mostly greenish-white flowers of which the labellum and part of the petals may be extended into long tentacular appendages giving the flower a fantastic appearance. An example of this is *H.* aff. *dracaenifolia* which we found near a waterfall shortly before we were robbed by rascals. Such are the perils of orchid hunting in PNG. Another common genus is *Peristylus*, but they are not much to shout about. *Cryptostylis* fits in here, and though I have seen it lower down, I can not persuade it to grow at the Sanctuary. There are several species of *Goodyera* and their allies, of which the finest I have seen is *Lepidogyne sceptrum* with a long spike of salmon orange flowers, but that too can not stand the cold of the Sanctuary. This applies also to the jewel orchids, *Macodes* and allies, which I have gloried in at lower altitudes, but not found in the true highlands. The only 'near-jewel' that we have is a *Zeuxine* (cf. *Z. alticola*) which has a broad white stripe down the middle of its leaf. Last, but not least, in this widespread group is the delightful little *Pristiglottis coerulescens*, which lightens up the dark leaf-mould with its little jade-blue flowers above a dark green rosette of leaves.

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* Cribb lists 5 species of *Paphiopedilum* from PNG. Two, *P. bougainvilleanum* and *P. wentworthianum* are from the Nth. Solomons

Ghost Orchids

The name Ghost Orchid was applied to the minute and inconspicuous *Epipogium aphyllum*, probably the rarest orchid in Britain, because of its colourless translucent appearance and its habit of not turning up for years and then appearing in a different place. We have its counterpart in the highlands of PNG in the form of *Epipogium roseum*. This will suddenly crop up in unexpected places, such as a coffee plantation. It is more robust than the English species, of similar colour and appearance, but with more pink in the flower. A similar chlorophyll-less saprophyte is *Stereosandra javanica*, seen lower down but not at the Park. Another curious saprophyte, which looks like, but is not an orchid, though in a closely related family (*Corsiaceae*), is *Corsia* sp. which we have seen nearby and introduced into the Park. These are truly elusive 'spooks'.

Other Forest Orchids

There are other delightful ground orchids to be found in the deep forest. The minutest of these is a tiny *Acianthus* (unidentified and probably unrecorded) which only pops up for a few weeks, flowers, fruits, and then dies down again. It is a perfect miniature, only attaining to 5 or 6 cm. This also applies to *Corybas*, of which we have two species in the Park. One looks like one of those old-fashioned gramophone horns, white outside and purple within. Another has a 'jewel-orchid' leaf with silver-pink veins, but the flower is modestly bent over like *Pterostylis nutans*, showing only its white outside. There are, as far as I know, only two species of *Pterostylis* in PNG. These are *P. papuana*, which is common in the Park and allied to the Australian *P. acuminata*. The flowers start greenish pink and finish up a bright salmon. The other species, *P. caulescens*, is an inhabitant of the upper montane forest and I have found it difficult to grow. It often occurs as a low epiphyte and has very large flowers, almost brick-red when mature.

The Calanthes

Calanthe is a wonderful genus, the name meaning 'beautiful flower'. Some of the Calanthes from other countries are perhaps larger and more colourful, but we have some delightful, if more modest, species in PNG. They all have a spike of numerous flowers above pleated leaves. The commonest in the Highlands is *C. flava* which, as its name suggests, is yellow. Many forms are greenish, but some, especially in the Enga province, are bright yellow. An even finer yellow, nearer orange, is shown in *C. chrysantha*, but it is a lower altitude plant (1300 m) and will not grow for us. Another species (*C.* aff. *leucosceptrum*) has waxy flowers of a pure glistening white, extending to the bracts and even to the pedicels. *C. orthocentron* is also white, and like a smaller edition of *C. engleriana*. This occurs locally. One of our Calanthes is still unnamed; it has long spikes of greenish-white flowers, each shaped like a little man. Then there are some definitely green ones, of which the commonest is *C. micrantha* with small flowers but often yellow-spotted leaves. Another is exceptionally robust, producing quite large flowers on a spike which may attain a height of 2 m. Finally there is a curious group of Calanthes which have short dense basal flower spikes with conspicuous bracts, giving a somewhat pineapple effect. The flowers are small, pure white with a bright red labellum (Probably *C. rhodochila*). We found one recently in the Enga Province and introduced it into the Sanctuary.

The Liparids (*Liparidinae*)

This is a small group comprising the genera *Liparis* and *Malaxis*, of which there are many species, mostly in the forest, but some *Liparis* grow in the open. Both genera can be found in the tall dense *Miscanthus* (Pitpit) grassland underneath which is an almost forest-like microclimate. Schlechter puts *Malaxis* under *Microstylis*, but they are now all called *Malaxis*. Most representatives of these genera are small green-flowered plants of no great attraction except for their wonderfully intricate flowers. However, *Malaxis megalantha* has the largest flowers in the genus, being orange when mature, and I brought an almost black *Malaxis* back from Bougainville. The best *Liparis* is *L. spectabilis* whose small but numerous flowers are yellow-green to orange with a bright scarlet labellum. Another nice one is *Liparis alpina* growing in a wet alpine rill at 3500 m on Mt. Wilhelm, with bright yellow flowers. These high alpines are almost impossible to grow at our altitude. Recently on Mt Maip (Enga Province), I found a loose growing grassy species in wet ground with flowers of a bright

Top left - ***Phaius flavus*** Lindl.
Photo by T.M. Reeve.
Top right - ***Corybas sp.***
Bottom left - ***Calanthe sp.***
Bottom right - ***Cymbidium papuanum*** Schltr.

Photos by N. Cruttwell.

(See pages 247 & 249.)

orange brown. We are trying that.

Two Australians (well, nearly)

Fairly common on high mountain grasslands are two familiar Australian genera, *Spiranthes* and *Thelymitra*. As far as I know, there is only one species of each, both designated *papuana*, presumably differing slightly from their Australian cousins. Both grow naturally in our Park area at about 2000 m. The *Spiranthes* is deeply pink-tipped, and the *Thelymitra* varies from pinkish, through mauve to a periwinkle-blue. It only opens in full sun, and then not for long, and does not really compare with some of the beautiful Australian sun orchids.

The Beautiful Ones (*Phajinae*)

Phaius (I have been told) means 'beautiful' and certainly the well known *Phaius tankervilleae* is one of the most spectacular ground orchids in the world. I first heard of it some 40 years ago when I was pioneering the Daga country and a white recruiter told me about these 'orchids with flowers 4 inches across growing in the swamp'. I could hardly wait to get there. Sure enough the mountain swamp was full of them, with the typical coppery brown flowers with white backs. Since then I have seen them all over the highlands, including, near Goroka, the beautiful citron yellow form. But there are two other species, one of which, *P. montanus*, is similar to *P. tankervilleae*, but with longer, darker leaves and wide-opening flowers of the same coppery hue within, but with a yellow margin and yellow backs. The flowers last longer and it is really a finer plant. It tends to grow in more sheltered places. The third is *P. flavus* with golden yellow flowers, within and without, the lip tipped with orange-brown. When open widely, it is a very beautiful plant, but so often it self-pollinates and remains half-closed. This is a bad habit among this group.

The 'Spoon-Tongues' (*Spathoglottis*)

These are the characteristic orchids of the Kunai grass plains and are found all over the country. All are normally purple but may vary through shades of pink to occasionally pure white. In the highlands we really only have three species. The commonest of these is *S. paulinae* which occurs in North Queensland and is very variable, sometimes quite spectacular, but often pale and disappointing. Undoubtedly the best highland species is *S. portusfinschii* which grows in *Themeda* grasslands on steep gravelly slopes along the highlands highway. It flowers after the leaves have died down and makes splashes of vivid purple in the grass. There are delightful mauve and pink forms, some of them very pale, though I have never seen a pure white. It is happiest at an altitude of about 1500 m and does not flourish at our Park. The one which does flourish is *S. parviflora*, rather ineptly named as its flower is no smaller than that of *S. paulinae*, and is a vivid rose purple with the labellum base bright yellow. The lip is not truly spatulate, more spade-like. The leaves are narrow and grassy. Unlike the others it forms clumps and produces many flower sprays at the same time. But like so many of its kind, the flowers do not stay open for long. I have seen it as high as 2700 m where it becomes more compact and the flowers remain open longer.

Eulophia

This genus, which reaches its magnificent climax in Africa, is represented by a few species in PNG highland grasslands. The commonest is *E. squalida* with green and white flowers. Another appears to be *E. dahliana* with a spike of quite attractive pink flowers with a purple labellum. I have seen *E. venosa*, a nice thing, but not near here, and finally there is the striking *E. macrorrhiza* which has no leaves, but a massive green photosynthesising rhizome just under the ground. A massive flower spike bursts out the ground to a height of 1 m, densely covered with large pinky brown flowers. It is quite a striking sight.

Cymbidium

This comes last on my list of terrestrials, as it is the last of such in Schlechter's classification. Unlike the Australian species, all three PNG *Cymbidium* are ground orchids. They are *C. ensifolium, C. lancifolium* and *C. papuanum.* The first is a low mountain orchid. *C. lancifolium* I have not seen in situ, but the Highland Orchid Collection at Laiagam has one. *C. papuanum*, however, grows naturally in our Park. It is a very small plant with 2 to 3 pale green leaves surmounted by a small inflorescence of up to four typical *Cymbidium* flowers. The colour is cream, overlaid with deep purple banding and spotting. It appears to be a semi-saprophyte with fleshy roots in the deep leaf mould which it favours. It dies down soon after flowering and remains dormant till next flowering time. It is an attractive little plant and supposed to be quite rare.

It favours deep shade but can tolerate more open situations. It is an elusive species and probably commoner than is supposed.

Conclusion

I realize that I have omitted quite a few of PNG's ground orchids, but many of these come from lower altitudes and are not able to be grown in our Sanctuary. In my garden at Goroka, I manage to grow some of the more tropical species which will not tolerate the low temperatures of the Park, which may descend to 10 °C or even lower at times. I hope that these articles have given the reader some idea of the incredible richness of the PNG orchid flora, and the necessity to preserve it before too many unknown species are lost for ever.

FROM THE BACK OF THE BUSHHOUSE

Brian Pepperall.
GPO Box 2002, Brisbane, Qld. 4001.

Conservation is a topic of major interest to all growers of Australasian native orchids. While we may wish to be active on a worldwide basis in conserving native orchids, there is much we are not doing in our own backyard, over the fence behind the bushhouse. ANOS Council has appointed a Conservation Sub-Committee headed by Graeme Bradburn whom I have asked to put together a report for a future issue of *The Orchadian.* This month, I have asked Brian Pepperall who is the Australian Orchid Council Conservation Coordinator to place before our readers his thoughts on conservation of Australian native orchids – Editor.

A recent article in *The Orchadian* expressed a wish for someone to set up a coordinated Australian conservation effort. The thought has doubtless crossed many minds, but to my knowledge the setting up of an Australian Orchid Council (AOC) Conservation Coordinator some two years ago was the first positive step taken by any group to set up an Australia-wide effort. This is not to make light of the efforts of many branches of ANOS and various individuals and societies who have been doing conservation work for years. However, the AOC is an Australia-wide organisation and therefore offers the possibility of national cooperation.

The AOC appointment was an acknowledgement of conservation initiatives by the Queensland Orchid Society (QOS), and a desire to see such practices adopted on a national basis. The QOS has been attempting for about three years to fill a conservation gap which exists: namely to ensure that inevitable development (i.e. that which can not be prevented by other conservation groups) does not result in orchid loss. In other words, QOS wished to know of all areas where orchid populations were threatened by development or land use so that coordinated efforts could be made to remove, and establish elsewhere, all orchids that might otherwise be destroyed. Threats perceived were sanctioned development, forestry operations and agricultural clearing. Re-establishment areas included national parks, botanical gardens, schools, local council areas and private collections.

Initial talks with public service officials indicated that legislation was a most difficult option and that it should be preceded by proof that QOS could make the system work. Existing environmental legislation needed to be used to begin with. The initial thrust was to set up a network of people, statewide, to monitor development and act as expert consultants for assessing the orchid flora in impact studies and making recommendations for their removal. Thus far the results have been disappointing from two aspects:

1. The lack of assistance given by orchid societies within the State.
2. The inability of the present legislation to offer QOS access to the impact study process.

The second problem is being pursued vigorously. The first is proving the most difficult and no general support seems to be forthcoming. Individual support and support from some societies is enthusiastic but the few can not do all the work.

A second thrust was to establish close ties with the state forestry department and its personnel. This has been most successful. Now we are notified when all large scale clearings are taking place so that wholesale collections can be undertaken. These collections are occurring from Brisbane to Ingham, with local societies organising them.

Future thrusts are to include local government authority contacts and agricultural land clearing in the relocation programme. Limitations at present appear to be communication problems and manpower problems.

Transferring these into the national sphere has begun but has been slowed by lack of response until recently. State conservation coordinators are now in place. This, given sufficient publicity, should now begin to centralise the effort, avoid duplicity and create a unified conservation policy and thrust in each state. ANOS groups already have these in place and it is heartening to see ANOS members as state coordinators. The beginnings of a national strategy, hopefully supported by Federal legislation, may be in the offing. It requires, now, an exchange of information nationally and the input of State and local societies to achieve a widely accepted, unified orchid policy.

Quite obviously, people will see other directions and priorities to be pursued. I have said nothing about habitat preservation. That does not mean it is not important and would not be pursued at some stage. The importance of preservation by propagation has not been mentioned. Naturally, the Australian Orchid Foundation (AOF) gets full support and all native growers should be selfing and forwarding seed to the AOF seedbank.

Education is important. The public and orchid growers as well should be educated about orchids and preservation.

Conservation must begin somewhere and gather momentum. Then all the associated things mentioned can fall into place. Despite all the concern about conservation it does not translate automatically into willing assistants. And we must not overload those who are willing. The solution seems to be to move slowly, with a few priorities, and let success draw others in.

I take this opportunity to invite any one who has an opinion, a solution, a problem needing a solution, the ability to assist, the knowledge, the organisational skills to contact myself or your state organisation, and we will endeavour to do something about it or with it.

SECOND ANOS AUTUMN SHOW – SUNDAY 29TH APRIL, 1990.

Walter T. Upton.
PO Box 215, West Gosford, NSW 2250.

Following the most successful Autumn Show at Ken Russell's last year, at which we saw the very latest in Australian native hybrids (see *The Orchadian*, Vol. 9, No. 9: 212-213), most of which are not seen at our Spring Shows, it has been decided to hold the second ANOS Autumn Show in the Brentwood Village Auditorium in Avoca Drive, Kincumber. It is to be hosted by the very active and keen Central Coast Group of ANOS.

Much enthusiasm has been shown by many ANOS Groups for this show and at a show meeting arranged by the Central Coast Group, delegates from the Wollongong, Port Hacking, Sydney and Warringah Groups attended. Ken Russell also came down from Dungog. It was a most ebullient meeting and from the numerous ideas and planning in progress, the show will be a great success.

The venue is superb – The Brentwood Village is a large retirement complex with an extensive recreation and community complex. The large auditorium is ideal for the orchid show and the sales area will be in the delightful Solarium. Kincumber is approximately 10 kilometers from Gosford. Take the Entrance Road out of Gosford, just after East Gosford, turn right into Avoca Drive and travel via Green Point to Kincumber.

The Show Schedule has many classes for native species and hybrids which flower during April, some classes covering both New Guinea and Australian orchids together. The *Dendrobium* sections *Latouria, Phalaenanthe* and *Spatulata* are included. Grand Champion of the Show will win a prize of $100 while there are two sub-championships each valued at $50.

The Show will be open on Sunday 29th April from 10.00 a.m. to 4.00 p.m. Admission is $2.00 with pensioners $1.00 and children free. Refreshments are available at the venue. Benching will take place on Saturday from 4.00 p.m. to 7.00 p.m. and on Sunday morning from 6.30 a.m. to 8.00 a.m. For further information contact John Andrews (Ph. 043-282-017) or Helen Dafter (Ph 043-677-694).

Ira Butler,
The Man and His Work

Ruth Rudkin

For those of us whose interest in orchids began in the late 1970's or 80's, Ira Butler was just a name associated with the registration of orchid hybrids or trophies presented to winners of Australian Native Orchid Hybrid Sections of ANOS and State Orchid Society Shows. Who was this man? What was he like, and what did he do?

Ira Butler was born in the small country town of Mungindi, on the N.S.W. - Queensland border. At the age of 12 he was sent to Sydney Boys High School, from which he matriculated to the University of Sydney. At one stage he considered becoming a missionary. While at university he came under the influence of Professor Anderson, an unorthodox Professor of Philosophy.

He majored in Agricultural Economics and later obtained employment with the Reserve Bank of Australia, a job which took him overseas on a number of occasions. During the Second World War he went to Great Britain to advise on food production. Following the War he visited many countries to study the role of Government Banks in various situations. Finally, he became Deputy Head of the Reserve Bank under Dr. Coombes. Reg Trenerry remembers the impressive office at the top of the Commonwealth Bank Building with its magnificent views of Sydney.

During the war he married Dorothy English, a fellow bushwalker, who later, as Dorothy Butler, was the Australian Geographic Adventurer of 1988. Her account of Ira's proposal and her subsequent trip by bicycle to Melbourne to get married are described in the *Australian Geographic* No. 16, Oct-Dec 1989. One must remember that during the war, train travel was severely restricted, but this did not deter Dorothy, the bushwalker, rock and mountain climber extraordinaire. The tale of this journey indicates something about this man and his wife - both were exceptional.

By the early 1950's Ira was growing orchids, reading the *Australian Orchid Review* and had joined two orchid societies, North Shore and Ku-ring-gai. He grew Cymbidiums, soft cane Dendrobiums and Lycastes, as well as native orchids. He describes in an article, found among his papers, how one damp day in September 1951, as he was walking along Pitt Street, he found a spray of three *Cymbidium* flowers on the footpath. It had been damaged but two flowers were still intact, and what's more, the shape was an improvement on any he had at home. He gave one flower to a girl in the office and took the other home. He called it *Cymbidium* Pitt Street and pollinated his plant of *Cymbidium alexanderi.* A seed pod developed, and matured twelve months later.

Meanwhile, he had moved, with Dorothy and their four children, to a new house on a bushland block in Wahroonga. His orchids were scattered about under trees, especially one large bloodwood.

While bushwalking in the Blue Mountains he came upon a rotting log in an area where *Cymbidium suave* was common, and found a number of seedlings growing out of a crack. They were no more than white root-cum-rhizome masses although some were several inches long. This prompted him to see if he could grow his *Cymbidium* seed in a similar manner on the compost of his adult plants. For many months nothing happened, and he eventually lost interest.

The following year, while cleaning up under the bloodwood, he found four orchid seedlings, all with substantial leaves two or three inches long and growing robustly. They had grown under the surface of the leaf litter, forming relatively substantial bulbous-rhizome-rootlike tissue. These first leaves were substantially larger when compared to the first leaves of an orchid grown in flask. The following year he found three more seedlings in some leaf mould and sand some 15 metres from where the seed was sown, in a spot which was dry and never watered.

From such a beginning, Ira became interested in orchid hybridisation, first with Cymbidiums and then with soft cane Dendrobiums (many of which he grew on the concrete roof of his garage) and finally native orchids. He began with *Dendrobium kingianum,* a bright and hardy plant he had growing on a rock. He pollinated flowers with *Dendrobium falcorostrum* and *D. speciosum* and was surprised to find the pods full of ripe seed by Christmas - so very much faster than the *Cymbidium* crosses. The seeds were sown in flasks and some were planted out before the following winter. This was the beginning of his *Dendrobium* Bardo Rose and *D. Xdelicatum* breeding. Older members of North Shore and Ku-ring-gai Orchid Societies, among others, may remember the many seedlings he brought to give to members at meetings.

In an article on native orchid hybrids, Ira said his short term objective was to create better quality and more variety in plants of the *Dendrobium kingianum* type, giving hardy, compact plants which could be part of anyone's garden in Sydney. Many of his plants were disappointingly infertile, but he felt that attempts should be made to produce fertile hybrids. He wanted hardy, vigorous plants like *D.* Bardo Rose, with flowers as big as, or bigger than, *D. falcorostrum.* He also envisaged a colour range from deep red through to white, with greens and yellows, and a few with contrasting lips. He thought it should be possible to get compact, floriferous plants by crossing *D. kingianum* with some of the terete-leaved species as well as *D. monophyllum.* Another short-term objective was to extend the flowering season so that some plants would be in flower at almost any time of the year and suggested that *D. tetragonum* and *D. monophyllum* crosses would do just that.

At about this time he gave financial assistance to Roger Bedford to build a large shadehouse to grow their seedlings to 3" pot size, which Roger undertook to sell. This arrangement proved very successful.

Ira then began to look around for an orchid group in which work on hybridisation had not yet been undertaken, but which had some promise of attractive results. He picked the genus *Sarcochilus.* The target for the hybridisation program was to produce plants similar to the larger flowering species, with flowers of different colours, and again to produce hardy plants which were easy to cultivate.

His first attempt was to cross *Sarcochilus hartmannii* with *S. olivaceus.* He had many difficulties working out satisfactory methods of culture and many seedlings were lost. Finally, in 1962, he flowered *Sarcochilus* Canary, a beautiful yellow flower with the "ginger" perfume of *S.olivaceus.* The racemes were upright and showed none of the clumping often seen in *S. hartmannii.*

The second hybrid to flower was *Sarcochilus* Fitzhart - *S.hartmannii* x *S. fitzgeraldii.* The coloured centre of the latter parent was dominant. The plants were vigorous and the flower presentation considerably improved on that of the parents. Other hybrids soon followed, *S.* Phyllis, *S.* Melba, *S.* Minuet, *S.* Lois and *S.* Southern Cross. Of all these crosses, he was most pleased with *S.* Lois because of the large flowers, and the variety of colours. One of the most successful of these is *S.* Lois 'Joybells'.

At the same time he tried an intergeneric cross with *Sarcochilus hartmannii* and *Rhinerrhiza divitiflora,* creating the hybrid *Rhinochilus* Dorothy. He later registered *R.* Rona, the cross between *Sarcochilus fitzgeraldii* and *Rhinerrhiza divitiflora.*

Ira Butler could see no obvious reason why some members of the genus *Sarcochilus* should not hybridise with members of other vandaceous genera, perhaps even the large growing tropical species. Since that time Roger Bedford has registered *Sarconopsis* Lavinia (*S. hartmannii* x *Phalaenopsis amabilis*). He tried a hybrid with an *Ascocentrum* but did not get any seed. In fact, he found it difficult to obtain seed of secondary hybrids, but suggested that with more hybrids available to breed with, this difficulty should be overcome. Time has proven him correct.

The Butlers' front garden was a native bush garden with a row of paperbark trees along one side. At the back was a large shadehouse, 10 x 10m. His laboratory was a room inside the house. In his hybridisation program he used dry seed on Knudsen's medium, plus, of all things, Vegemite™. When the seedlings were about 5mm tall he deflasked them into community pots. His breeding plants were growingin the garden. He tried many types of composts, including bush humus. In all, he made somewhere between 300 and 400 crosses and produced thousands of plants from flask. Many crosses were not named as they were not thought to be of high enough quality. Ira did not have a glass house until he bought a small one only a couple of years before he died.

Although Ira stated that "it was best to push along (with hybridising) with what material was available rather than to delay a season or more seeking out the best parents in existence", he was always on the lookout for that extra special plant. Laurie and Carrie Friar of Grafton remember taking him to see a red *Sarcochilus fitzgeraldii* which they had found in the bush, and he was able to obtain some pollen from this plant. Ira remarked ..."this will put me five years ahead in my breeding program".. He did manage to get some seedlings from this plant by putting the pollen onto a Blue Knob *S. hartmannii* (*S.* Fitzhart IB 1/91), but he died a short time later.

Some of Ira's best hybrids were *Dendrobium X delicatum* IB 181 and a very good white *D.* Ellen, IB 198. *Dendrobium* Hilda Poxon was created by Ira and registered by Noel Grundon in 1977. He also produced a successful cross between *Dendrobium fleckeri* and *D. speciosum*, which was later repeated and registered by David Cannon as *D* Sunglow.

His sudden and unexpected death in 1972 shocked the orchid fraternity. His beloved plants were given to ANOS, in both Sydney and Melbourne, and auctioned. Many were purchased by W. and J. Cannon, then of Wayside Nursery in Port Macquarie. Hybrids sold by them always had the prefix IB if they had originated from Ira's collection. His plants are now well dispersed and, who knows, many of us may have some of his original crosses.

Ira kept meticulous records of all his hybrids, recording both his successes and failures. Some of these records are know in the hands of Phil Spence and some are held by David Cannon.

Ira, who was always very generous and helpful with advice to young growers.

In 1969, the 6th World Orchid Conference was held in Sydney. Ira was on the Steering Committee as Treasurer and Consultant on Australian Native Orchids. The financial success of the Conference was credited largely to the advice he gave. He received a bronze medal for his *Dendrobium* Kingrose, and with his help, North Shore Orchid Society was awarded first prize in the Native Orchid Display Section.

His friends tell many stories of visits to Ira's home, especially after he had retired. A big man, he was usually found in his shadehouse, sitting on a cushion on a large, upturned pot, with a glass of beer in his hand. Sometimes he would sit, saying nothing for ten minutes or more. He was always happy to talk orchids, and, as Keith Irvine told me, one always listened carefully to his advice which always made good sense. To some he seemed enigmatic, reserved, and sometimes blunt, but always honest and straightforward and nothing if not generous. At orchid society meetings he is remembered for his plant descriptions and talks. He always preferred the natives to exotics and encouraged members to grow them. His other interests included classical music, especially Sibelius, photography and painting. His wife Dorothy, was, and still is, unconventional and an enthusiastic adventurer. His four children were also adventurous, two of them unfortunately loosing their lives. Daughter Wendy died while cascading in the Blue Mountains and son Norman sustained a fatal snake bite while bushwalking near Nimbin in northern N.S.W..

Above all Ira was passionate about Australia's native orchids and was appalled by the vandalism inflicted upon our native orchid species by people indiscriminately ripping them out of the bush. This was his overriding motive for the breeding of attractive, easily grown hybrids for orchid growers everywhere, thus helping to stem the removal of orchid species from the wild. For this reason the Ira Butler Trophy Committee was set up to encourage others to continue his work.

In researching this work I have to thank firstly John Stuart, a long time friend of Ira's and founding Chairperson of the I.B. Trophy Committee for his memories and copies of some of Ira's articles. Thanks are also due to Roger Bedford, David Cannon, Murray Corrigan, Laurie and Carrie Friar, Keith Irvine, Bill Smoothey, Phil

ANOS AWARDS

Under the recently introduced system of ANOS Awards, two clones of *Sarcochilus hartmannii*, owned by Mr Ken Russell of Dungog. NSW, were each awarded a Highly Commended Certificate (HCC) on Sunday, 22nd October 1989 at ANOS Sydney Group Inc.'s Sarcanthinae Show held at Castle Hill.

At the time of benching, Ken indicated to the Show Marshal that he wanted four of his plants of *S. hartmannii* considered for awards. These nominations were duly passed on to the ANOS Registrar of Judges, Mr Sid Batchelor.

During the judging of the show, *S. hartmannii* 'Red Snow' won the section Best *Sarcochilus hartmannii*. It went on to become Champion *Sarcochilus* Species of the Show.

Following the Championship judging, the ANOS Judges gathered to assess the award nominations. The four clones of *S. hartmannii* were put together on a separate table and the judges independently assessed each clone for shape, colour, size, substance, floriferousness and habit of inflorescence. When the award judging was completed, and the points tallied by the ANOS Registrar, *S. hartmannii* 'Red Snow' had gained an HCC with 76.8 points and *S. hartmannii* 'Noelene' had also gained an HCC with 76.1 points.

The announcement of these results was greeted with considerable jubilation by all present for it represented the granting of the first such awards under the ANOS Award System, apart from a Cultural Certificate given previously to Mr Bernie Fletcher for a lovely pot of *Pterostylis pulchella*.

S. hartmannii 'Red Snow' and *S. hartmannii* 'Noelene' are both fine examples of the so-called Numinbah Valley form of this species. This form tends to have flowers which are flatter and more perfectly round in overall shape than other forms of *S. hartmannii*. Also there is a red/brown colour in the centre of the flower which is often quite pronounced, resulting in a striking contrast between the dark central nucleus and the pure crystalline white of the surrounding segments. If there are any faults with the Numinbah Valley form, then these are that the substance of the flower can be a little thin and the flower count maybe somewhat reduced.

For many years it has been the Blue Knob form of *S. hartmannii* which has commanded most attention among native orchid enthusiasts. With its thick, almost succulent, leaves, erect inflorescences and virtually pure white flowers, a good Blue Knob *S. hartmannii* is indeed a lovely sight. A considerable amount of work has been done in the breeding of Blue Knob *S. hartmannii* and many of the best clones now in cultivation are the result of selective breeding.

However, over the last couple of years, the Numinbah Valley form has been coming to the attention of growers and breeders. It is not so much that it is a better forrn, horticulturally, than the Blue Knob form, is is simply different. The coloured centre of the flower is the attraction and while the appearance is somewhat reminiscent of *S. fitzgeraldii*, the distinction is immediately apparent. The flowers of *S. fitzgeraldii* are pure white with a pink or purple centre, whereas the Numinbah Valley *S. hartmannii* has reddish brown in the centre of the flowers. I suppose brick red is a fair description of the colour, although some I have seen tend towards orange. Also the labellums of these two species are totally different.The size of the flowers on many Numinbah Valley forms of *S. hartmannii* is quite impressive, with diameters in excess of 25mm not unusual. The four plants Ken Russell submitted for award were all large flowered clones with wide, over-lapping segments.

The role of feeding cannot be overlooked in producing larger than normal flowers and improving floriferousness, and Ken is well known for his adherence to a regular feeding program, particularly foliar feeding. The results of such a program were evident in Ken's plants as they all had lush, dark green leaves with a healthy sheen.

The flowers were carried on arching inflorescences and were beautifully displayed, an important feature in *S. hartmannii*, where on many clones the flowers face the terminal end of the inflorescence rather than outwards. On *S. hartmannii* ' Red Snow', the inflorescence which was judged for the award carried 10 fully open flowers and one bud. The flowers were 26mm across. On *S. hartmannii* 'Noelene', the judged inflorescence carried 12 flowers, 27mm across.

Mike Harrison

See photos on page 272, rear cover.

TOWARDS A BETTER ROOT SYSTEM

Denis Lynch
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(This article appeared first in the Newsletter of the ANOS Far North Coast NSW Inc. and is reproduced here with the agreement of Denis Lynch, and the members and Editor of ANOS Far North Coast Group NSW Inc. I gratefully acknowledge their assistance – Editor.)

Possibly one of the most often repeated pieces of advice passed on from the experienced grower to the novice is that an orchid must have a good root system if vigorous and healthy growth and optimum flowering is to occur. Such a simple and sensible statement can, and in fact usually does, leave the novice or lesser experienced grower with a dilemma. Just how do you initiate and maintain the root system that is so important to the well being of the plant?

Introduction

One of the frustrating things about orchid books is that, for all of the information on culture, housing, pests and diseases, very little of the text relates specifically to the root system. Admittedly, all of the information given applies to the well being of the entire plant, but references to the root system are usually very brief. With this in mind, I will attempt to start at the beginning.

Preparation of Plant

Let us take the case of the plant or piece of a plant that has had its effective root system damaged beyond repair. This can happen when a plant is removed from its host for some reason, when a pot-bound plant is broken up into several pieces, or when deterioration of the potting medium causes the root system to rot. The first job is to remove old flower spikes, dead or dying leaves, very old or dead pseudobulbs and the remnants of sheathing bracts. Then turn your attention to the root system. Very carefully, completely cut away any decayed roots as these could be a source of reinfection of the remaining good roots or new roots by harmful bacteria or fungus during the reestablishment of the plant. Trim the damaged roots back beyond any fractures while being particularly careful not to harm any good roots that may have remained intact. Any damage to the pseudobulbs or any fracture or cut in the rhizome should then be sealed with grafting mastic or some similar compound.

Final treatment of the plant prior to remounting or repotting is to soak it in a fungicide and fertilizer solution for ten to twenty minutes. I prefer a solution to which the fungicide Zineb® has been added at full strength and to which Aquasol® has been added at one third the normal rate. I also add a small amount of Field Pack®, a weak liquid fertilizer that contains a wetting agent as well as trace elements. When the fertilizer/fungicide soak has finished, the plant can be tied securely to its host, or staked firmly and potted. Take extreme care when doing this so as not to inflict any more damage to the remaining roots.

The primary consideration for the plant now is an environment that will aid recovery and regeneration of root growth without stress. Therefore, I would put it in the most humid section of my bushhouse, where it would get at least 50% shade and good aeration. As I mist all of my native orchids two to three times daily in preference to pot watering, the plant would receive the normal treatment as well as additional misting if conditions become too dry. Apart from additional misting, the plant would receive the same liquid fertilizer, insecticide and fungicide treatments as all of the other plants in the bushhouse.

As I stated previously, the most important point to remember is to allow the plant and its root system the time to recover without stress or setback. Once the plant shows advanced signs of recovery, its environment can be changed slowly by shifting it around the bushhouse until you consider it has the conditions to grow and flower to its optimum. Changes to the plant's environment should be as gradual as possible so that its increasing recovery and growth rate are not inhibited.

The Bushhouse Environment

Once you have established a good root system on an orchid, the aim then is to create the conditions in the bushhouse in which the root system will continue to grow, increasing in size along with the plant and giving the basis for continual optimum growth and flowering. I will attempt to explain my ideas on maintaining that root system in good order under the following headings: humidity; aeration; hygiene; nutrition; and mechanical protection.

Humidity

Established plants can withstand dry periods and then recover quickly once more favorable conditions have returned if they have good root systems. Although I tend to keep my orchids drier throughout the coldest winter periods, I see little advantage in subjecting the plants to unnecessary stress by letting them dry out too much. Experiments that I have carried out with some epiphytic orchids seem to indicate that placing them in a harshly dry area not only causes the plants to wither rapidly but also causes the green root tips to wither and die. When such a plant is returned to a humid environment, it recovers reasonably quickly, but the root system takes a much longer time to regenerate new green tips and to start growing again. Obviously the root system is much less tolerant of a harsh environment and deteriorates rapidly and then enters a state of forced dormancy. Premature winter dormancy is also evident on the root systems of many orchids when bushhouse conditions are kept too dry through the autumn months.

Some of the finest examples of epiphytic orchids that I have seen growing naturally must be those in the immediate area above a waterfall. In these locations the orchids were subjected to a constant updraught of very humid air and seem to have absolutely thrived because of this. Humidity is obviously important to maintain a vigorous root system, but it must be balanced with aeration and light requirements. There are many ways of increasing the humidity of the bushhouse environment and they vary from very simple to very elaborate as follows:

1. Allowing for the fact that good aeration can be maintained and that plants can be placed so that they receive their required amount of light, it is better to have the bushhouse slightly overcrowded because it is much more difficult to maintain a good growing atmosphere in a large area occupied by a few plants.

2. Blue metal or some other aggregate on the floor, and/or pools of water under the benches, can provide water that will slowly evaporate and increase the humidity.

3. Compatible plants such as ferns can be grown under the benches and around the pools. If space permitts, ferns could also be grown in pots on the benches or in hanging baskets.

4. Installation of a permanent misting system designed to cover the whole bushhouse gives the option to rapidly increase the humidity when desired. I favour a reasonably fine misting system in preference to a Microjet® watering system because it gives one more control over one's bushhouse environment. The misting system can be left on for brief periods to merely humidify the environment or it can be left on for increasingly longer periods depending on the amount of soaking required. A finer mist also tends to blow around with the prevailing breezes, getting to all those difficult to wet nooks and crannies.

5. A Microjet® watering system installed under the benches makes easy work of damping down the floors, watering the ferns and topping up the pools.

6. A circulating system of trickling water on one or more of the shadecloth walls makes use of the prevailing breeze to give areas of constantly high humidity.

7. Blocking off the southern and western walls of the bushhouse with Polyscrim® or some other material can transform the bushhouse from a wind tunnel into a gently aerated environment and can thus stop any drying winds from robbing you of your humidity.

Pot watering is also a way to increase the humidity immediately around the plant, but obviously this cannot be overdone. If the orchids in the bushhouse are misted regularly and the relative humidity is kept high, pot watering is required less frequently and there is less chance of waterlogging and subsequent risk of damage to the root system.

Aeration

Orchids need a constant movement of air around them to grow well. They will not thrive in a stagnant environment but merely survive. The air movement is of benefit to the roots as well as the foliage and should be such that it will prevent the roots from remaining waterlogged for extended periods of time. It is better to give your plants some protection from strong or cold winds and the southern and western walls of the bushhouse could be closed off with Polyscrim® or some other suitable material. However, if you do this, remember the importance of good aeration and leave the bottom 300 mm of the southern and western walls covered only by shade cloth. If the roof is covered by plastic or fibreglass, leave a similar space for a breeze at the top of the walls also.

Once you have achieved good air movement in the orchid house, the next step is to ensure that the roots of all of your plants get the benefit of it. Slab culture on natural cork or hardwood is an obvious answer, but it has some disadvantages as well as the fact that not all orchids are suited to it. Humidity must be kept high to achieve optimum results from slab culture, but you get excellent drainage and you can readily see the condition of the root system. However, the roots are so exposed that they can deteriorate rapidly under harshly dry conditions (such as that encountered at a show for a few days) and are more open to mechanical damage and attack by some pests.

Gutter guard cylinders filled with coconut fibre or some suitable coarse material are a good compromise between slab culture and growing orchids in pots, and seem to offer more protection to the root system. Tree fern is also a good host; it gives better root protection but not all orchids are suited to it.

Plastic pots can trap water around the roots of your plants and I prefer to increase their drainage considerably. With a 125 mm squat pot for example, I would add about 10 additional holes to the base, with about 16 extra holes in the sides. With these additional holes and a very coarse mix (at least 12 mm pieces of bark, charcoal and rock), much improved drainage and aeration are achieved. Shallow plastic dishes are also good for growing some orchids as long as they also have plenty of holes and the same coarse potting mix is used.

Baskets made from wire mesh and lined with shadecloth give excellent drainage and aeration to the roots and are a good alternative to using large plastic pots for bigger plants.

Benches should have weldmesh tops (or something similar) to give good air movement around the pots, and plants should be suitably spaced so as not to restrict this air movement. Improved drainage and aeration can also be obtained for plants in plastic pots by hanging them from the walls or the roof.

Hygiene

It is important to keep up a regular pest control programme because the root system of your orchids are enclosed in a pot and damage to the roots is not usually noticed until it is too late. It is not convenient or desirable to tip all of your plants from their containers on a regular basis to inspect the roots for damage, so pest prevention should be practiced continuously.

With increased drainage holes and coarse potting mixes, the average orchid pot becomes an ideal hideout for a variety of unwanted guests such as slugs, slaters, small and large snails, cockroaches, mealy bugs and occasionally cutworms (or army worms). It is therefore important to keep the orchid environment or bushhouse and the surrounding areas clean and free from weeds to minimise sources of infection for these pests. Other measures would include pot-watering with Mesurol® and Lorsban® solutions on a regular basis to eliminate infestations in the pots and spraying the surrounding areas with the same pesticides. The insects and pest mentioned can play havoc with a root system in a very short period of time, destroying months of successful cultivation and affecting the flowering performance and growth of the plant.

Hygiene of the root system also includes prevention of harmful fungal and bacterial infections and this can be most easily achieved with good aeration and careful potting and watering. Soggy or sour mixes are not the sort of environment to promote or maintain good root growth.

Nutrition

The root system of an orchid is an important gatherer of nutrition for the plant, but these roots also use a portion of the nutrients. A balanced programme of weak strength fertilizer given frequently is a good aim in your orchid cultivation, provided care is taken to prevent toxic build up of salts by flushing the roots with a good watering between each application. I think it is also important to maintain some organic materials in the root area, provided they do not interfere with aeration and drainage. This can be arranged by topping the pots with an organic mulch, such as Plant Magic® or something similar, a couple of times a year. I believe this assists the survival of beneficial fungi around the roots. Rather than use chemical fertilizers exclusively, I suggest the inclusion of some organic fertilizers such as Fish Emulsion® or Nitrosol® or a "home brew" on a regularly basis. The regular use of a root growth stimulant such as Formula 20® is also probably worth trying.

Mechanical Protection

Root systems confined to a pot are relatively safe from abuse except by unwanted pests as indicated above, and, of course, at times of repotting and potting on. It makes good sense when repotting to be as careful as practicable with the exposed roots so that the plants suffer the least amount of setback. By all means cut away any rotting or damaged roots, but disturb the good part of the root system as little as possible.

Plants grown on slabs are prone to all sorts of damage from intruding grasshoppers and locusts, to attaching themselves to immovable sections of the bushhouse structure. These sorts of damage can usually be minimised by careful observation and bushhouse management, and by very careful handling when moving plants about.

Conclusions

I would like to stress the importance of maintaining a vigorous and healthy root system to get the most from your orchids. The root system is usually not seen and damage is usually noticed too late. A combination of good cultivation, aeration, humidity, pest control, nutrition, care and bushhouse management will go a long way towards producing the best from your plants. By all means use the expertise of other orchid growers, but remember that you are the master and the expert within your own bushhouse environment.

OBITUARY: THE REVEREND RONALD DOWSE COLLINS, 1918-1989

Len Lawler and Bruce and Joy Gray.

Ron Collins was born in Townsville on 22 January 1918, the youngest of a family of nine. When he was a few weeks old, his mother took him by ship to Cardwell and then in her arms on horseback to "Kirrama" station, the family home over the ranges west of Cardwell. It was here that he grew up, developing his respect and love for the bush.

Ron was educated at The Southport School and later at St Francis' College Brisbane, graduating Th.L. from the Australian College of Theology in 1942. He began his ministry in the Church of England as deacon in 1941, and priest in 1942, becoming a bush brother during the war years. In 1947 he went to England where he served in two parishes, returning to Australia in 1949. He served as rector at Proserpine, Home Hill, Mareeba and West Mackay, before retiring to Atherton in 1963, when he was licensed to officiate in the Diocese of North Queensland.

It was while he was in England that Ron became interested in orchids. After attending a Chelsea Flower Show he is reported to have said that if these flowers could be produced in such a climate, he would be able to grow them easily in north Queensland. He became an orchid grower while at Proserpine, and was a foundation member of the Mackay and District Orchid Society.

Ron's interest in orchids became a passion during his retirement years. He gathered together a splendid collection of species orchids and became a devoted worker for the Atherton Orchid Society, being president at his death. A great lover of books, he is largely responsible for the excellent library enjoyed by the Society's members. He was an untiring advocate for the Australian Orchid Foundation.

His retirement was also a time for the quickening of his interest in native orchids. Patient exploration gradually unveiled locations for almost all the species reported from the Tablelands. Ron also joined almost every expedition north of Cairns, generously providing his vehicle, and became involved in the finding of several new species. His home became a rendezvous where parties gathered, outfitted, victualled and often overnighted. His visitors book is a twenty-five year who's who of Australian orchidology. Ron was Vice-president of the Atherton Tableland Group of ANOS from its inception.

As a north Queenslander, Ron was intensely interested in local history. Combining this interest with that in orchids, he researched the history of orchid discovery in north Queensland, and presented his findings as a paper at the 8th Australian Orchid Conference, Townsville, 1983.

Ron's friendship was treasured by many people and families; he was easy to confide in and always ready to help. All of us lucky enough to have known him well experienced his hospitality, generosity and friendship and will miss him sadly.

He is survived by his wife Enid, and children Jennifer, Alban and Mark.

His memorial is *Cadetia collinsii.*

BOOK REVIEW

ORCHIDS OF WESTERN AUSTRALIA – CULTIVATION AND NATURAL HISTORY: SECOND EDITION

Edited by Kingsley W. Dixon, Bevan J. Buirchell and Margaret T. Collins. 210 x 148 mm, 68 pages, soft cover, 57 colour plates, 13 line drawings. Published 1989 by the Western Australian Native Orchid Study and Conservation Group (Inc.), PO Box 323, Victoria Park, WA 6100. Price $9.00 plus $2.00 packing and postage; orders of 25 or more attract a discount of 25%.

This book is important for at least two reasons. Firstly, it is the only book on orchids of Western Australia in print at present. Secondly, the proceeds from sales will be used by the Western Australian Native Orchid Study and Conservation Group (Inc.) to help in the fight to preserve orchid habitats in Western Australia. Already the WANOSCG is committed to mounting a legal challenge for the protection of 60% of the remaining plants of the rare and endangered Purdie's Donkey Orchid (*Diuris purdiei*). Without doubt, the proceeds of sales of this book will be put to good use.

The book comprises eight chapters and three appendices. In the opening chapter, "What is an Orchid" is described in easy-to-understand language. Then follows chapters on "Cultivation of Australian Terrestrial Orchids", "Seed Propagation of Ground Orchids", and "Creating a Bush Garden for Native Orchids" which deal in a general nature with their subject, using examples from Western Australia flora to illustrate points. The remaining four chapters deal specifically with Western Australian terrestrial orchids, "Orchids of the Perth Region", "Tropical Terrestrial Orchids of Western Australia", "The Pollination of Western Australian Orchids", and "The Mini-Spider Orchids". The Appendices contain recommendations for further reading and some sound advice on "Orchid Photography" and "Preparing for Field Trips".

The standard of the text of the various chapters is commendably even in quality despite the fact that at least five authors contributed. Unfortunately, the authors of the first chapter and two of the appendices are not acknowledged. The line drawings are clean and illustrate the points made in the text clearly, but again the illustrator/s are not acknowledged. The quality of the colour plates is excellent and, thankfully, the photographers are acknowledged.

The cultivation of Western Australian terrestrial orchids is comprehensively treated from the viewpoints of pot culture, soil mixes, repotting, housing, watering, fertilizing, pests and diseases, multiplication, flowering, and, most importantly, source of plants. While the chapter on seed propagation contains much technical information, that information is dealt with in common sense language and could be followed by hobby growers with little trouble.

The common sense approach continues into the chapter on creating a bush garden for native orchids. While much of this information might appear to be specific for Western Australian orchid and tree and shrub species, the principles outlined apply in any state of Australia, and could be used to create a bush garden in eastern and tropical climates of the country. The chapters which deal with subjects specific for Western Australia will be of great value to naturalists and the more seriously minded hobby growers who live in or who visit that state.

I would recommend this book for all people interested in Western Australian terrestrial orchids, their cultivation, their propagation, their distribution, and their photography. Hobby growers of terrestrial orchids of eastern origin will also find the information of great value and should give more then serious consideration to purchasing the book and convincing their orchid societies to place copies in their libraries.

Noel J. Grundon.

ANOS PATRON HONOURED

Our patron, Mr. G. Hermon Slade, has been honoured in this year's Australia Day Awards. He has been made a Member of the Order of Australia (AM) in recognition for his contributions to horticulture and science over many years. We take this opportunity to congratulate Hermon on behalf of the Society for this well deserved recognition.

PRELIMINARY TRIALS ON THE USE OF ENZYMES FOR THE CULTURE OF AUSTRALIAN NATIVE ORCHIDS

Reg Angus.
55 Campbell Avenue, Dee Why, NSW 2099.

Prior to my retirement, in the days when I knew even less about orchids than I do now, I was employed in the field of industrial chemistry, and often worked in conjunction with a company that produced a pelletised combination of enzymes and bacteria which was used for a variety of applications in sewage treatment. The product was effective, non-toxic to humans and animals, did not attack live tissues, and was named Actizyme® (Actizyme is a Trade Mark of Southern Cross Laboratories Pty. Ltd., PO Box 2, Dural, NSW 2120). Having read many publications detailing the manner in which symbiotic fungi may be important for assimilation of nutrients for most orchids, I was struck by the similarity of the biodegrading systems of sewage treatment plants and the symbiotic fungi-orchid relationship.

The major components of Actizyme are: amalyase, an enzyme which converts starches to sugars; protease, an enzyme which converts proteins to amino acids; cellulase, an enzyme which breaks down cellulose to starches; and lipase, an enzyme which breaks down fatty materials into fatty acids and glycerol. The 'life' of enzymes is not extensive, and the bacterium *Bacillus subtilis* is included to produce new enzyme activity, allowing the action to continue. Theoretically, Actizyme would not only provide energy compounds such as sugars and starches by break down of detritus material in your medium, but should also make available to the plant the phosphorus, sulphur and nitrogen from proteins and amino acids and complex organic fertilizers you may already be using.

Experimentation

I decided to carry out limited testing on three of what I consider to be the more difficult NSW terrestrials: *Caleana major*, *Prasophyllum elatum* and *Dipodium variegatum*. Plants of the same species were gathered, with permission, from the same area, and equal numbers were planted into two pots which contained a commercial medium from the same batch. The pots were placed side by side in my bushhouse so that they would receive the same amount of light and water with the exception that, once every month, the test pot was given a cup of water in which half an Actizyme enzyme pellet had been dissolved, while the control pot received a cup of water without any additions.

Observations

Prasophyllum elatum: The control plant was shown to a meeting of ANOS Warringah Group Inc. in September 1988, when it had a 41 cm tall sheath, but no sign of flowers breaking through. The treated plant was exhibited at the ANOS Warringah Group Inc. Show in September 1988, where it was one of my plants which won the category "Best Group of Three Species". The flowering sheath was 68 cm high, the spike 76 cm high, and the inflorescence 19 cm high bearing 30 flowers and two unopened buds. Neither plants flowered in 1989, and when the pots were tipped out, only the husk of the original tuber was found.

Caleana major: The plants in the control pot made good leaf growth, but did not flower in 1988. The treated plants, however, have one flower and two buds on a spike 30 cm tall, and two other plants have initiated spikes. After flowering in 1988, the treated plants died back and then produced new leaves, completely out-of-season. By the early 1989-90 summer, the treated plants have produced new leaves but have not flowered as yet. It is interesting to note that, in the Manly-Warringah area, I have not found any plants of *Caleana major* in the bush to date (January 1990).

Dipodium variegatum: Although I planted a *Eucalyptus gumifera* plant in each pot with the *Dipodium variegatum* plants, the eucalypt soon died in each pot. When the eucalypt died, I placed a number of Actizyme pellets under the surface of the potting mixture of the treated plant and continued to water the pots. The control plant did not flower in either 1988 or 1989. The treated plant flowered in 1988, producing 14 flowers. The treated plant flowered again in December 1989, but the flower spike was very short and the few flowers were clustered at the top of the spike. However, this plant is now (January 1990) producing a second spike which appears strong and healthy.

Discussion

I wish to make it clear that these results cannot be claimed as conclusive. They are observations which, although based on a small sample and without the necessary scientific controls, indicate a breakthrough might be possible in the cultivation of orchids which depend upon a symbiotic fungal relationship. I am hoping that someone with experience in this area will take up the challenge and initiate studies into:

(a) What is the effect of dosing with Actizyme on the orchid-potting mix system? We know that Actizyme will not damage live plant tissue, but does the release of nutrients cause a population explosion among the fungi and what effect does this have?

(b) What is the optimum dosage of Actizyme to give most benefit to the orchid plants?

(c) At what rate are we wasting enzymes by overdosing?

I intend to continue my experimentation with the same species, and will be including *Leporella* sp. and *Caladenia menziesii.*

Finally, I would point out that Actizyme may not be of any use to epiphytes mounted on bark or wood as the enzymes might permanently degrade the support medium. However, if epiphytes or lithophytes were grown in a pot with river pebbles and inorganic components such as perlite, (e.g. some *Sarcochilus* sp.) then better absorption of nutrients from your organic fertiliser may be obtained.

POLLINATION OF *PERISTERANTHUS HILLII* (*ORCHIDACEAE*) BY *METRIORRHYNCHUS RUFIPENNIS* (*COLEOPTERA: LYCIDAE*)

P.I. Forster.
Botany Department, University of Queensland, St. Lucia, Qld. 4067.

Peristeranthus hillii (F. Muell.) T.E. Hunt is a large orchid belonging to the subtribe *Sarcanthinae.* It occurs in coastal regions of eastern Australia from the Hastings River (28°52'S, 153°34'E), New South Wales to the Daintree River (16°15'S, 145°25'E), Queensland with inland occurrences to about 100 km (Dockrill 1969; Queensland Herbarium (BRI) records). The species occurs in various rainforest community types such as tableland rainforests and wet lowland forests in north Queensland (Lavarack and Gray 1985) and in drier semi-evergreen vine thickets and araucarian microphyll vine forests in southeast Queensland.

Wallace (1980) reported the pollination of cultivated plants of *P. hillii*, 150 km south of the known species range, by *Agonischius australis* Candeze (*Elateridae*) and an unidentified species of *Metriorrhynchus* (*Lycidae*). On October 19, 1986, several individuals of *Peristeranthus hillii* (Forster and Bird PIF2663 (BRI)) were observed in flower, 13 km south of Boonah, Queensland (28°07'S, 152°41'E) in a semi-evergreen vine thicket community on red krasnozem soil with loose basalt scree. Present on the orchid inflorescences were several individuals of *M. rufipennis* Fabricius (Forster s.n. (UQIC)) that were feeding on nectar in the individual flowers. Examination of these beetles revealed numerous orchid pollinaria attached to antennae. From the drawings accompanying Wallace (1980), it would appear that the same species of *Metriorrhynchus* is involved. This note provides both a specific identification of the beetle and of its occurrence as a pollination agent within the natural range of the orchid.

Acknowledgement

Ms. M. Schnieder, Curator of the University of Queensland, Department of Entomology Insect Collection, provided the specific identification of the beetle.

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CONTRIBUTIONS TO THE ORCHID FLORA OF THE *ARAUCARIA* FORESTS IN NEW GUINEA - 7 *Dendrobium anosmum* Lindl.

N H S Howcroft
Forest Research, P O Box 134, Bulolo, PNG.

Wet weather from August to December, 1988, brought considerable relief to plant life in the Wau and Bulolo regions, resulting in an increase in flowering among many of the native orchid species, including *Dendrobium anosmum*. This species is fairly common in the Wau and Bulolo regions, but is often easily overlooked when not in flower. It inhabits trees and shrubs in the secondary regrowth and in the *Araucaria* forests of the lower Montane forests of the Wau and Bulolo valleys. Because the species is frequently associated with the *Araucaria* forests in these regions, I have included it in the Contributions' list of orchid species found in the *Araucaria* forests in New Guinea.

Description

Dendrobium anosmum Lindl., Bot. Reg. 22: Msc. 32. 1845. *D. macrophyllum* Lindl., Bot. Reg. 1839: Misc. 36, non A. Rich.. *D. superbum* Rchb. f., Walp. Ann. 6: 282. 1861. Ridl., Flora 4:52. *D. scortechinii* Hk. f., F.B.I. 5: 741. 1890. *D. leucorhodum* Schltr. Fedde. Rep. Beih. 1 (1912) 499.

Plant epiphytic with pendant to partly erect and arched stems around 100 cm long (Fig. 1A). **Leaves** oblong to elliptic-ligulate, unequally bilobed, 10-15 cm long, 2.2-3.5 cm wide. **Inflorescence** produced on a short raceme from the nodes (Fig. 1A) 1-3

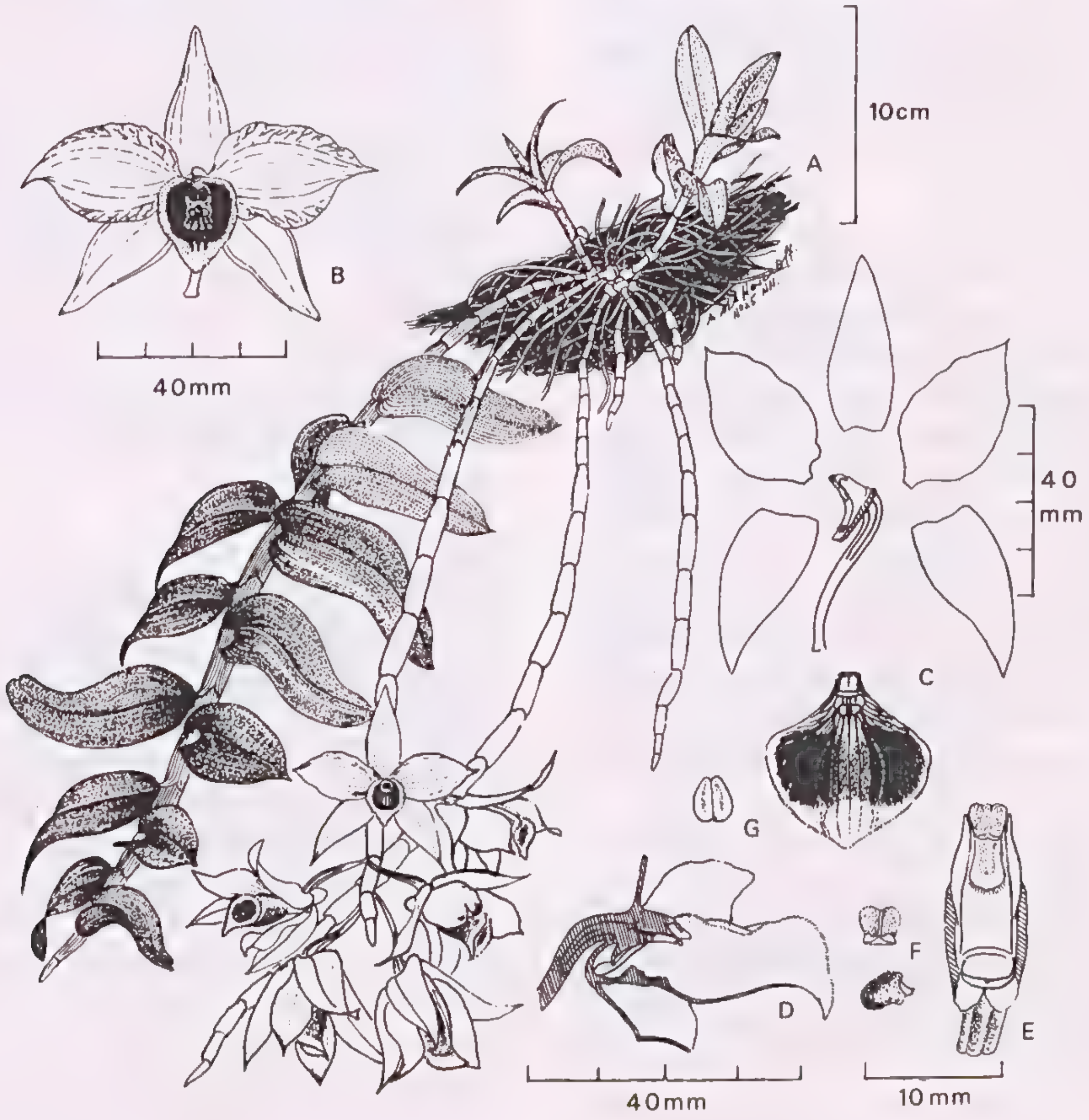

Fig 1. A: Plant habit; B: Flower; C: Exploded view of flower parts; D: Lateral view of sectioned flower; E: Ventral view of column; F: Ventral and lateral views of anther; G: Pollen.

flowered. **Flower** 6-7 cm across (to 10 cm; Millar, 1978); **sepals** and **petals** pale pink to white with mauve to rose margins (Fig. 1B), the **labellum** with deep purple in the gullet or in two purple patches (Figs. 1B, 1C) and purple veins towards the anterior, apex acute, pubescent within (Fig. 1C) with a fleshy subquadrate callus at base (Figs. 1C, 1D). **Column** short, glabrous, with trilobate clinandrium (Figs. 1D, 1E), laterals triangular, dorsal dentiform; apices of column foot with a orbicular pit. **Anther** broadly a square shaped hood, minutely serrulate (Fig. 1F). Pollen kidney-shaped, in pairs, waxy and yellow (Fig. 1G). **Ovary** and **pedicel** cylindrical and glabrous.

Distribution

The New Guinea entity has a wide distribution throughout the mainland, but the records are far from complete. Its altitudinal range is from sealevel to around 1300 metres above sea level. The most southern live collection in Papua New Guinea is from Milne Bay, outside Alotau, and the species extends into Irian Jaya (Van Bodegom, 1973).

Habitat

The species occurs in lowland and littoral forests. In the Bulolo and Wau areas, it is associated with both secondary regrowth and the *Araucaria* forests. The *Araucaria* species are rarely hosts to *D. anosmum*, but other tree species with moderately rough to deeply fissured bark growing in association with these conifers have acted as hosts to this orchid. In the City of Lae, this orchid is among a number of species that colonises the crowns of the street trees, particularly the Rain tree (*Samanea saman*) and the native *Kleinhovea*. Recent removal of street trees in some areas have resulted in numerous small boys trying to sell flowering specimens to visitors and the general public.

Flowering Period

Plants may flower at any time of the year depending on the surrounding conditions and the maturity and condition of the plant's pseudobulbs. A dry period preceding a wet season often sees the beginning of bud development. At Bulolo, the flowering may start as early as August and continue through until at least to January.

Conservation Status

A common species that requires no protection in Papua New Guinea.

Notes

The species belongs to the section *Eugenanthe*. Three species of this section have been found by the author in Papua New Guinea, the second being *D. stuartii* F.M.Bail. which was found in the Western Province in 1986 (other unidentified live collections predate this). The third species which had small, pale yellow to white flowers, was collected from hoop pine at Pimaga, in the Southern Highlands.

Schlechter (1912) mentions the existence of another species from British New Guinea, *D. mastersianum* F.v.M et Krzl., and stated that Kranzlin placed this species close to *D. primulinum* Lindl. However, in his publication on *Dendrobiinae*, Kranzlin (1910) compares the plant with that of *D. cretaceum* Lindl., and the flowers with that of *D. nobile* Lindl. In turn, he compares the habit of *D. cretaceum* with that of *D. pierardi* Roxb. The Pimaga species seemed closer to *D. primulinum*, but as the description of the labellum of *D. mastersianum* does not seem to fit the Pimaga species, it must remain unidentified until someone makes further collections.

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READERS' FORUM

New *Mediocalcar* species from PNG.

Dear Sir,

I write to draw your attention to a recent paper published by Mr Andre Schuiteman of Leiden, The Netherlands. "Two new species of *Mediocalcar* (Orchidaceae) from New Guinea" in *Blumea* **34**: 167-172 (1989). The two species are *Mediocalcar decoratum* Schuiteman and *M. subteres* Schuiteman.

The former (*M. decoratum*) is a widespread species in New Guinea and extends to about 2500 m above sea level in parts of the Enga Province of Papua New Guinea. A photograph appeared in the *Orchadian* **9** (9) page 196 as *Mediocalcar sp. nov.* This species often has four leaves at the apex of the pseudobulbs, but the number of leaves varies from 3 to 6. It is one of the prettiest species in the genus and has been well named.

The second species, *M. subteres,* is much less common, but is clearly distinguished by its subterete leaves. The flowers are usually bright yellow in colour.

Yours sincerely,
T.M. Reeve.

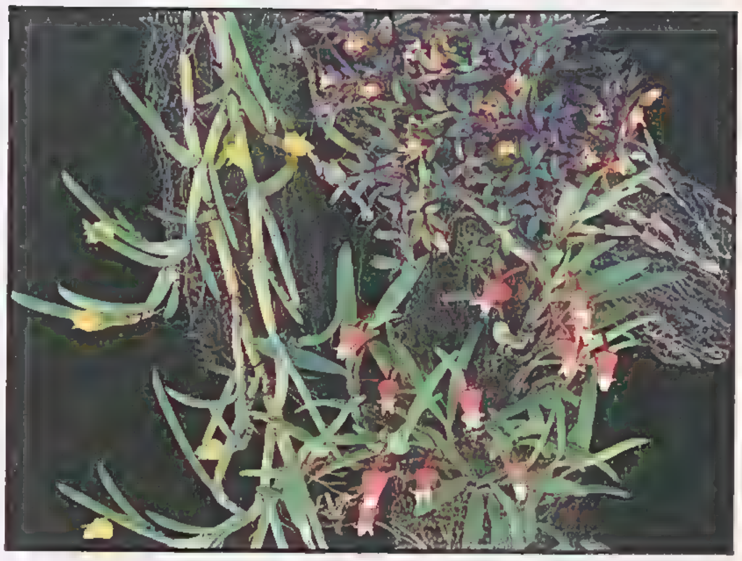
Cultivation of *Mediocalcar decoratum* Schuiteman in Sydney.

Dear Sir,

We were given a small piece of an unnamed *Mediocalcar* species (now known as *M. decoratum*)several years ago, which we promptly took home and potted in an open bark and gravel mix in an 80mm squat pot. We were told this species didn't like too much light and that it was cool growing, so it was placed among our pots of *Sarcochilus fitzgeraldii* in a spot which is rather well shaded (under 50% shade cloth, PolyScrim^{TM} and a tree).

How has *M. decoratum* fared?

It has grown considerablly and now spills over the edge of its original container. Slow release fertilisers and the occasional spraying with organic & inorganic fertilisers seem to suit this species. We flowered *M. decoratum* for the first time, last May, not many flowers, but we feel this can be improved with slightly higher light levels. It is a species which does not seem to attract snails, caterpillars or other bushhouse villians.



Three species of *Mediocalcar* in cultivation at the Highland Orchid Collection, Laigam, PNG.
Left: ***M. subteres,*** Top Right: ***M. decoratum***
Bottom Right: ***M. bifolium.*** Photo by T.M. Reeve.

Looking at the growth habit of this species with its shallow root system and tendency to ramble across the surface of the potting media we feel either saucer culture or possiblly a slab of treefern fibre would be appropriate.

Yours sincerely,
Allison & Mark Webb.

Further information on the two newly described *Mediocalcar* species.

Mediocalcar subteres Schuiteman is an epiphyte in montane forest and grows on moss covered trees including *Nothofagus* species and *Araucaria* species at altitudes of 1200 - 2000 m. This species has been found in the central mountains of Irian Jaya as well as the Highlands of Papua New Guinea. The plant has a creeping habit and produces flowers which are usually bright yellow or orange-yellow with the ovary bright greenish yellow.

Mediocalcar decoratum Schuiteman is a freely-branching, mat forming epiphyte found in montane forest on species of *Nothofagus, Castanopsis, Dacrydium* amongst others, at altitudes of 900 - 2000 m. It has been reported from Irian Jaya and Papua New Guinea. The flowers are usually orange red with yellow tips or, rarely, red with green tips, orange with white tips or entirely orange or yellow. The leaves are green but can develop a purple tinge if growing in high light. The plant is usually found growing in shaded areas.

Reference: Schuiteman, *Blumea* **34**: 167-172 (1989).

READERS' FORUM

Coelogyne fragrans or not?

Editor,

I would like to draw your attention to the photograph of the *Coelogyne* species in *The Orchadian* Vol. 9, No. 9, page 193. I am quite sure it is not *Coelogyne fragrans* Schltr., though it is commonly mistaken for it. It fits Schlechter's description of *C. fragrans* fairly well, but another rather rare species fits it so much better that there is no room left for error. And when you see them side by side, it is quite obvious that they are two different species. You may care to read my notes about this subject in *The Orchadian*, Vol. 7, Nos. 3 and 4, and compare the photographs.

The photo you have in the last issue is the species with my label CH-156, which may be *C. beccarii* var. *tropidophora* Schltr., but Schlechter's description is inconclusive and drawing non-existent, so we cannot be sure. Together with *C. beccarii* Reichb.f., it grows everywhere in the Highlands of New Guinea. In New Guinea, one sees masses of Coelogynes growing terrestrially and not flowering (Schlechter remarks on this on page 101 of his "Orchidaceen von Deutsch-Neu-Guinea" in connection with *Coelogyne asperata* Lindl. which he calls *C. pustulosa*, but it is equally valid for *C. beccarii* and CH-156), so it is quite easy to think that all those with glabrous pseudobulbs are the same. You do not know whether you have the *C. beccarii* or the CH-156, until you grow the plant epiphytically long enough for it to flower.

If you are lucky enough to have stumbled on a true *C. fragrans*, you know it the moment it opens its flowers. It is one of the three strongly scented New Guinea orchids - the other two are *Dendrobium anosum* Lindl. and *Dendrobium engae* T.M. Reeve. The Ch-156 may be slightly scented too, but only just enough to fool you into thinking that it could be *C. fragrans* after all, providing you have never been within a few metres of the real one while it is in flower. Not many people have, I can be sure of seeing only one or two in many years of collecting.

Tony Chadim.
8 Parker Street, Curtin, ACT 2605.

Noxious weeds threaten native orchids

Editor,

After reading "*Diuris venosa*: An orchid in danger" (Bates, R. 1989. *The Orchadian* 9 (7): 146.), it was interesting to note that the threats are from a noxious plant and a feral animal.

I believe this to be more widespread than we realise. Living on the McPherson Range (NSW — Qld border), we have a wide diversification of habitats within a few kilometres from east to west, including different types of forest and heathlands, dry and wet sclerophyll forests, rainforests and antarctic beech forests. Along the coastal swamps, lowlands and foothills, sand mining, farming practices, high-rise canal and residential development have taken their toll on terrestrials and epiphytes. *Phaius* sp., *Geodorum* sp., *Pterostylis*, *Dendrobium teretifolium*, *D. linguiforme* and *D. monophyllum* and the multitude of *Orchidaceae* of the lowland rainforest scrubs are all depleted or gone.

The steeper slopes which were originally rainforest scrub, are still being cleared for banana plantations. A regrettable practice by the majority of growers who abandon this industry is to leave the slopes bare of vegetation. The majority of plants that regenerate are introduced weeds, such as Wild Tobacco bush (*Solanum mauritianum*), lantana (*Lantana camara*), groundsel bush (*Baccharis halimifolia*), Croftan weed (*Eupatorium adenophorum*), mist-flower (*Eupatorium riparium*), and Johnson grass (*Sorghum halepense*), plus several thistles and other smaller weeds.

Springbrook plateaux were once so densely covered in forests that horses could not be ridden through it. Then dairying became the major land use and kikuyu grass (*Pennisetum clandestinum*) was planted and grew exceptionally well. The cattle kept the grass down and many of the rock outcrops and large boulders had orchids growing on them — notably *Dendrobium kingianum, D. speciosum, D gracilicaule* and *Sarcochilus hartmannii*. When the dairy farms closed down, the kikuyu grass grew over the smaller rock outcrops and boulders, followed by mist-flower which spread out of the creeks and roadsides and smothered out the kikuyu grass and any remaining orchids.

Most of the larger valleys have cliff faces with rock scree slopes at the base. Mist-flower and other introduced weed species now cover much of these cliff faces. After sufficient organic material has been collected by these smaller weeds, the larger weed species such as lantana, Croftan weed and groundsel bush, become established. Any orchids already growing on the cliff faces, such as *Dendrobium speciosum* and our breathtaking *Sarcochilus fitzgeraldii* and *S. hartmannii*, become shaded out, choked out or smothered to death.

Feral pigs are not a problem in this region. Pademelons, bandicoots and wallabies dig up tubers of terrestrial orchids and eat the leaves and flowers, but do not cause a major problem. However, fire has played a large part in local orchid destruction. Burning-off of dry pastures is a normal practice in this region, but if the fire escapes into National Parks, it can take a large toll of *D. speciosum, D. kingianum, D. monophyllum, D. linguiforme, S. ceciliae* and *S. hartmannii.*

Hence, the environmental alterations and destruction caused by mankind, along with his introduced weeds are the biggest destroyers and threat to some of our treasured native orchids, even in National Parks.

John Roberts.
MS 208, Numinbah Road, Advancetown Qld 4211.

AUSTRALIAN NATIVE ORCHID HYBRID REGISTRATIONS

(New registrations by the RHS from lists in *The Orchid Review*, August – December, 1989.)

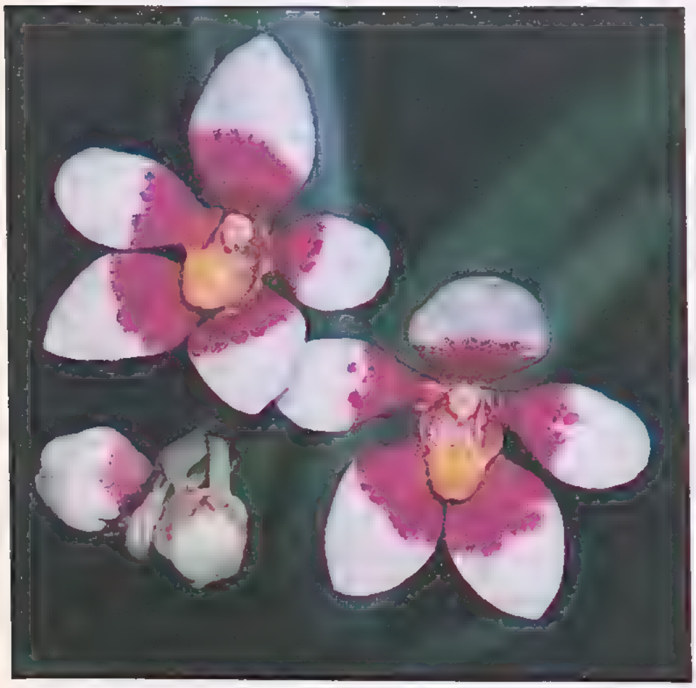
NAME	PARENTAGE	REGISTERED BY
Dendrobium		
Arakoola	Kim Heinze x *ruppianum*	R. & D. Sheen
Colonial Jem	Eureka x Gillian Leaney	P. Spence's
Elanora Star	Rosella x Ellen	W. Upton
Elegant Sunset	Suzanne x Star of Gold	W. Upton
Hewitt Glow	Graham Hewitt x Wonga	D. Cannon
Native Gold[1]	*semifuscum* x *speciosum*	D. Loch
Parakeet[1]	Peewee x *monophyllum*	W. Upton
Silver Eye[1]	Peewee x Bright Spark	W. Upton
Sofala	Carawah x Ellen	C. Brandon
Val Peck	Aussie Angel x Eureka	P. Spence's
Warrego	*linguiforme* x *lichenastrum*	R. Arnott

[1] These registrations will be listed as follows in the ANOS publication ***A Checklist** of Australian Native Orchid Hybrids*:

Native Gold	*trilamellatum* x *speciosum*	D. Loch
Parakeet	Suzanne x *monophyllum*	W. Upton
Silver Eye	Suzanne x Bright Spark	W. Upton

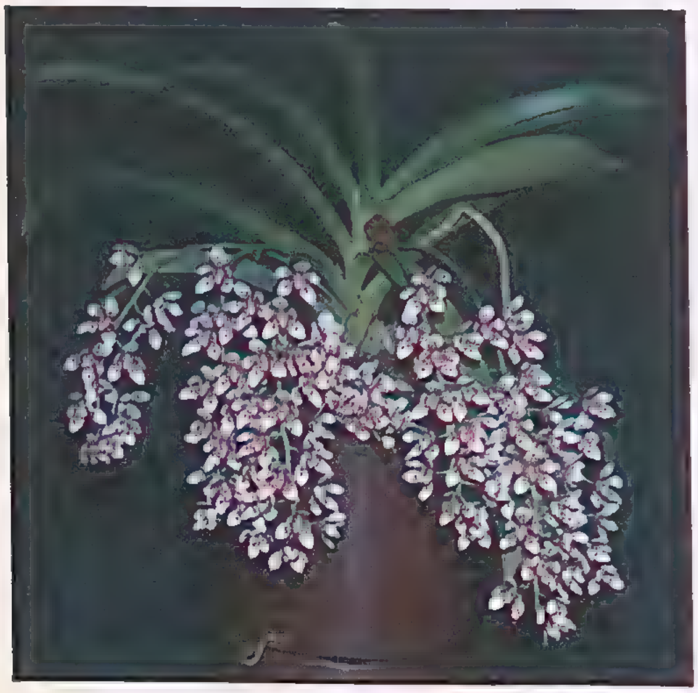
The following hybrids were published in the *Orchadian* Vol 9 no 8 as registered by the Royal Horticultural Society. They included a number of synonyms, which, if left uncorrected may cause confusion. ANOS currently recognises the following:

Dendrobium		
Castle	*Xdelicatum* x Gillian Leaney	W. Skillicorn
Elegant Queen	syn. Elegant Heart	W. Upton
Tasha Sakiguchi	White Gem x *antennatum*	D. Bartholomew



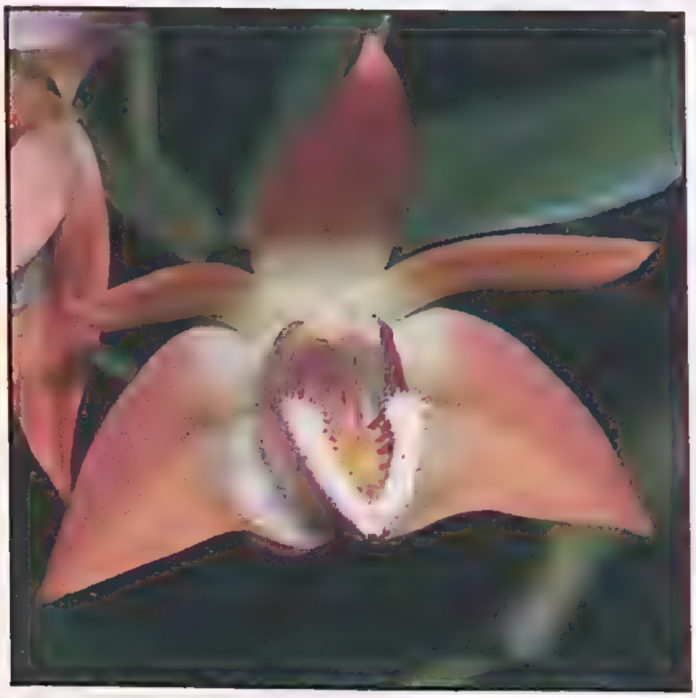
ANOS Sydney Group Inc. Sarcanthinae Show Illustrations (See Page 270).

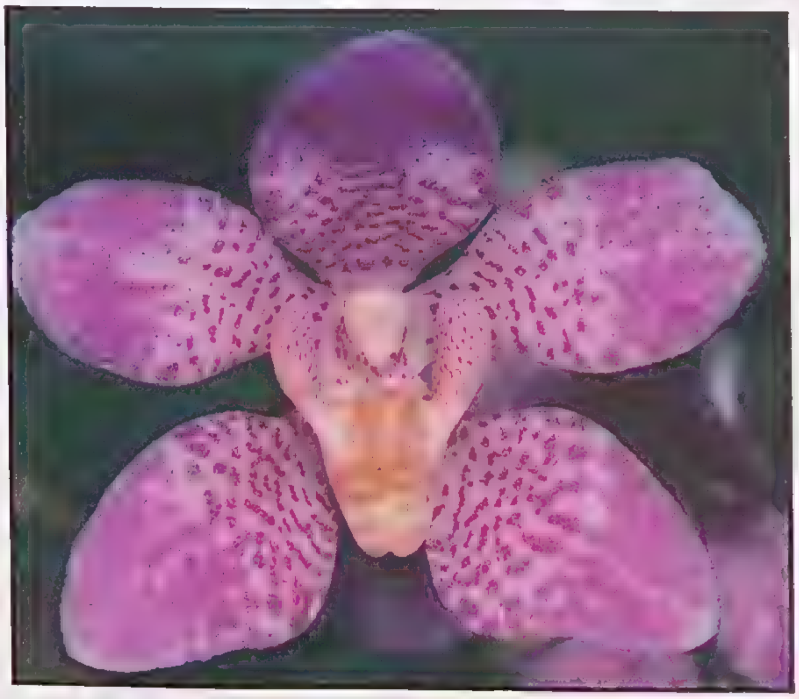
Left Page
Top : ***Sarcochilus fitzgeraldii*** F. Muell.
Centre: ***Sarcochilus* Weinhart**
Bottom left: ***Dendrobium fleckeri*** Rupp et. C. White
Bottom right: ***Sarcochilus* Sandon Rose**



Right Page
Top left: ***Sarcochilus* Jewell**
Top right: ***Dipodium pandanum*** Bailey
Bottom: ***Sarcochilus fitzgeraldii*** F. Muell.

Photos by Mark Webb.





SHOW REPORT

ANOS Sydney Group Inc.
Sarcanthinae Show

The 1989 ANOS Sydney Group Inc. Sarcanthinae Show was held in the Community Centre at Castle Hill on the 22nd October. The majority of plants were overshadowed by the matched quartet of *Sarcochilus hartmannii* benched by Ken Russell and situated in the eyecatching position opposite the door. Two of these were granted awards at this show (see page 255).

Although these superb clones dominated the Best *Sarcochilus hartmannii* Section there were a number of other fine specimens present which served as a backdrop for Ken's plants. Darryl Smedley benched his *S. hartmannii* 'Corella', a lovely Blue Knob form, and Ron Wheeldon's specimen plant was a testament to his cultural abilities.

The show was slightly early for a good display of *Sarcochilus fitzgeraldii*, but nonetheless, there were a couple of seedlings which possessed excellent shape and lots of colour. One of these was nearly red all over and the other was pure white with a solid dark red centre. I'm sure both of these will be spectacular with a few more years of growth. Both belonged to Ken Russell and are a result of his line breeding.

Further along the bench were to be seen a number of the smaller species including *Bulbophyllum minutissimum*, *B. bracteatum* and *B. wadsworthii.* Ferg Martin benched an excellent *Peristeranthus hillii* and Gerry Walsh several *Pteroceras spathulatus.*

As to be expected, Sarcanthinae hybrids were well represented and provided a mass of colour in the centre of the hall. In the section Best Primary Sarcanthinae Hybrid with *S. hartmannii* Parentage, Sid Batchelor's *S.* Weinhart really stood out. It displayed six pendulous inflorescences packed with beautifully spotted flowers, clearly demonstrating just what superb specimen plants these hybrids can become. Second in the section was Ron Wheeldon's *S.* Lois, also a lovely specimen plant with tall inflorescences carrying large, widely opening pink flowers.

The next section, Best Other Sarcanthinae Hybrid with *S. hartmannii* Parentage, was also well contested. Once again it was Sid Batchelor who benched the winning exhibit, an exquisite *S.* Jewell with three pendulous inflorescences of sparkling, bright pink spotted flowers. *S.* Heidi, owned by Ross Sadlier, was second in this section. Also worthy of mention was a plant of *S.* Sandon Rose benched by Ken Russell.

Best Sarcanthinae hybrid without *S. hartmannii* parentage was won by Mark and Allison Webb with a plant of *Plectochilus* Kilgra. This hybrid (*Sarcochilus falcatus* x *Plectorrhiza tridentata*) with its clear, apple green flowers attracts a lot of attention wherever it appears.

The terrestrials were represented by both tropical species and deciduous temperate species. The Evergreen Terrestrial Species included a number of large *Phaius tankervilleae* which dominated their corner, making a machete almost a necessity for judging. However, most notable in this section was a plant of *Dipodium pandanum* owned by Sid Batchelor which won this section. An excellent form of this species, it was in pristine condition for the show.

Dendrobium species and hybrids, although well out of their peak flowering season, were present in reasonable numbers. An excellent *Dendrobium fleckeri* won the Best *Dendrocoryne Dendrobium* Section. This clone, another example of line breeding by Ken Russell, had bicoloured flowers of orange and brown.

The Best Other *Dendrobium* section was well patronised and included many interesting species, most notably *D. rigidum, D. trilamellatum, D. smillieae, D. malbrownii* and *D. antennatum.* First in this section went to Darryl Smedley for his plant of *D. canaliculatum*, with John Lynch's *D. discolor* var. *broomfieldii* a close second.

In the section Best Other *Dendrobium* Hybrid, David Banks' plant of *D.* Impact made yet another winning appearance for the season (See photo *Orchadian* **9:**10 p221 1989).

All in all this was a very successful show with something to interest everyone.

Allison Webb

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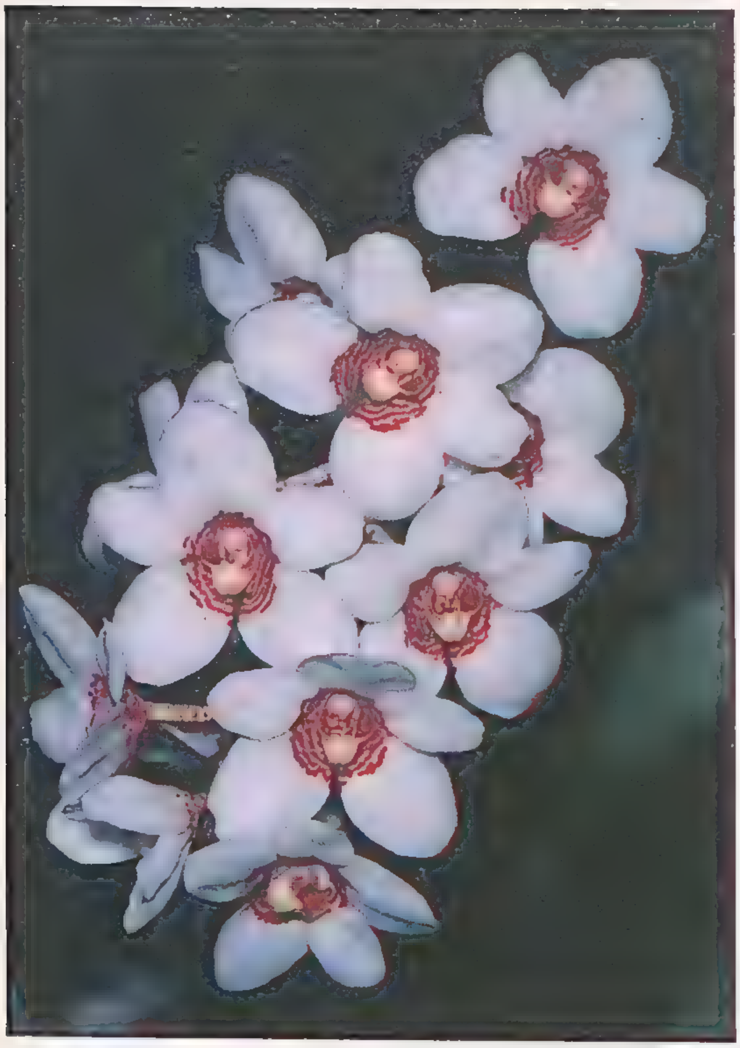

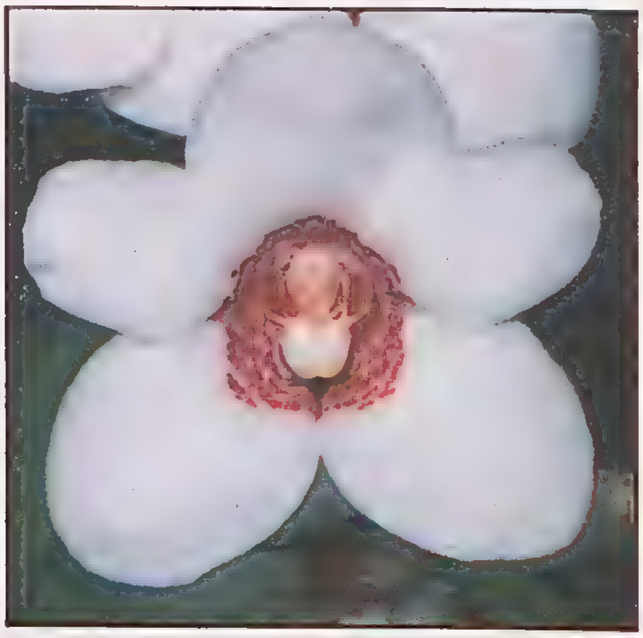

Sarcochilus hartmannii 'Red Snow'
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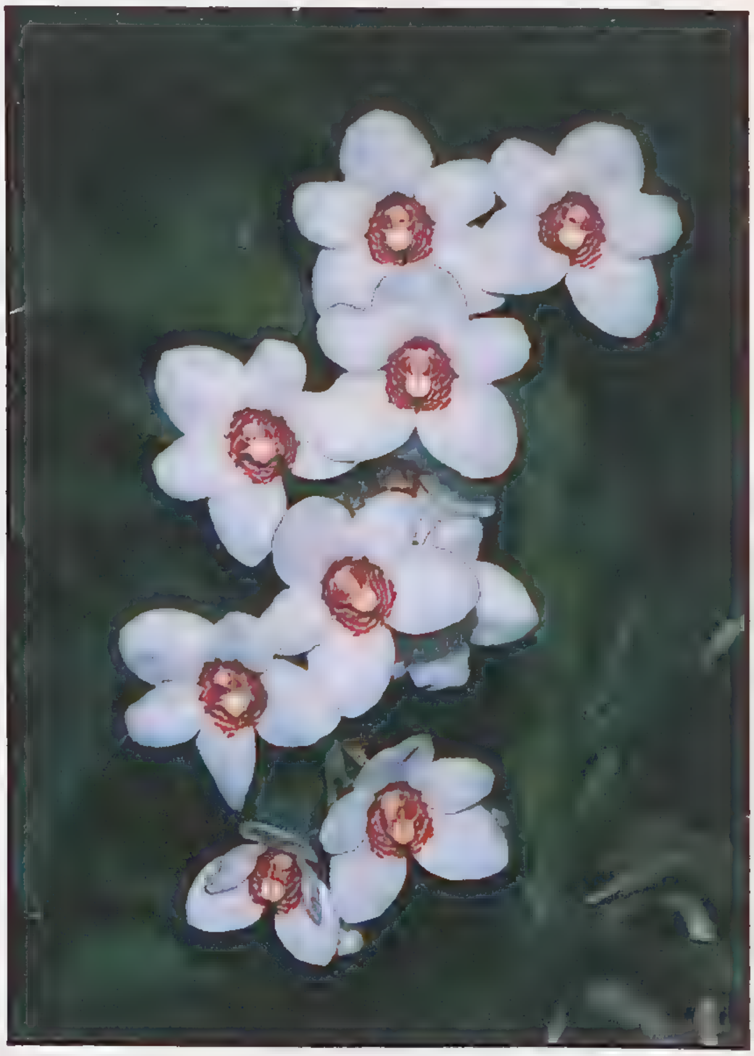

Sarcochilus hartmannii 'Noelene'
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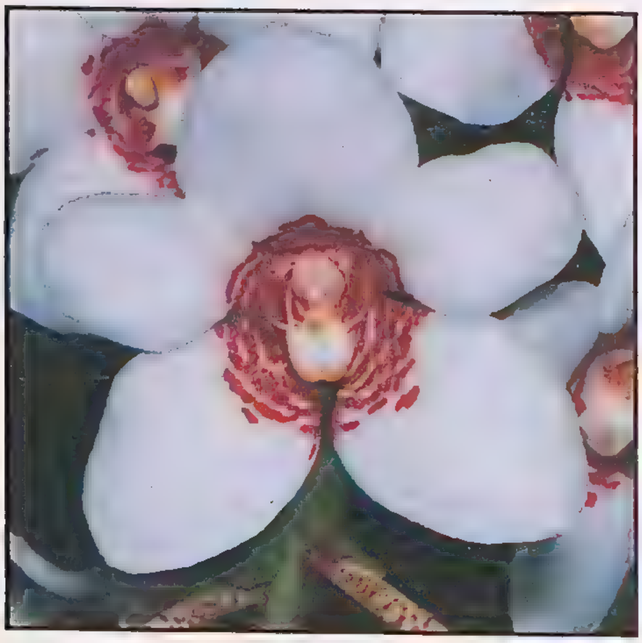

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Phaius tankervilleae (Banks) Bl.

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280 ... *Nervilia aragoana, Pachystoma holtzei, Phaius pictus.*
296 ... *Dendrobium* Aussie Treat, *D.* Lorikeet
297 ... *D.* Lowana Nioka, *D. bigibbum* x *D.* Ellen, *D.* Rosy Curls, *Paphiopedilum violascens*

Date distributed: 11th June, 1990.

CORRIGENDUM

The Orchadian **9**:10, p221 & 222 (1989), ***Dendrobium*** **Taurean** should read ***Dendrobium*** **Tarean**.

[illegible]
OF
VICTORIA
25 JUN 1990

EDITORIAL

The Orchadian

Volume 1, Number 1 of *The Orchadian* was published in August, 1963, as a 12-page typewritten periodical on foolscap sized pages. In August, 1965, the page size was changed to the size we still use in the present issues of the journal. For the first 14 years, *The Orchadian* was under the devoted editorship of Murray Corrigan who was not only the Editor, but also the typist and publisher. Murray Corrigan has commented on this period of the development of *The Orchadian* in his article in Volume **9**, Number 5, on page 96. Joe Betts took over the editorship from Murray Corrigan in 1977 and brought about some major changes in the style and format of the journal. Now, in 1990, with the inspiration of Mark Webb, *The Orchadian* is about to undergo another change, beginning with the next issue, the first of Volume 10. Details of the proposed changes are explained by Mark Webb in this issue.

Hence it is timely that we should review the progress made by *The Orchadian* over the period from its first major change in format to the next. In this issue, Joe Betts reviews the changes he has seen in *The Orchadian* from the time he took over the editorship in December, 1977, to the present day.

Conservation

A popular subject in past editorials has been the conservation of our native orchids (see Volume **9**, Numbers 3, 4, 10, and 11). For those people who wish to read more about what other countries are doing in this area, I recommend that you read the series of articles in the *American Orchid Society Bulletin* Volume **59**, Number 1, January 1990. Starting with the editorial, called Orchid Odyssey, Alec Pridgeon roams over a wide range of subjects, providing food for serious thought. Andree Millar's article is the highlight of the series. Titled "Conservation and Preservation of Our Native Species", it deals with Andree's experiences with conservation of orchid species in Papua New Guinea and Australia. This article is beautifully illustrated by colour plates of some well known Australasian species and hybrids, and ANOS and *The Orchadian* receive some worthy praise; thank you Andree!

An article by Natalie Warford, "Become Aware - and Let Your Conscience Be Your Guide", moves the scene to Mexico, while R.J. Griesbach tells us to "Stop Buying Wild-collected Plants". Joyce Stewart in "A Letter From Lausanne", tells us how many species of orchids came to be listed in Appendix I by the Plants Committee of CITES, and the outcome of this listing. She also provides much useful information on how to help protect and conserve native orchids and their habitats.

Carson E. Whitlow produces a short article on "Approaches to Reducing Collecting Pressure on Terrestrial Orchid Species" which has many ideas that could be applied in Australasia. Finally, Ann Lauer Jesup provides information on what the American Orchid Society is doing in the area of conservation of native American orchids in an article titled "AOS Conservation Committee: Steps in the Right Direction".

These articles contain many good ideas that could and should be incorporated into our own efforts in the conservation of Australasia's native orchids. I encourage you to read them and put your newfound knowledge and enthusiasm into practice.

Noel Grundon

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OBSERVATIONS OF ORCHIDACEAE IN THE RUSHWORTH FOREST

Peter Krake.
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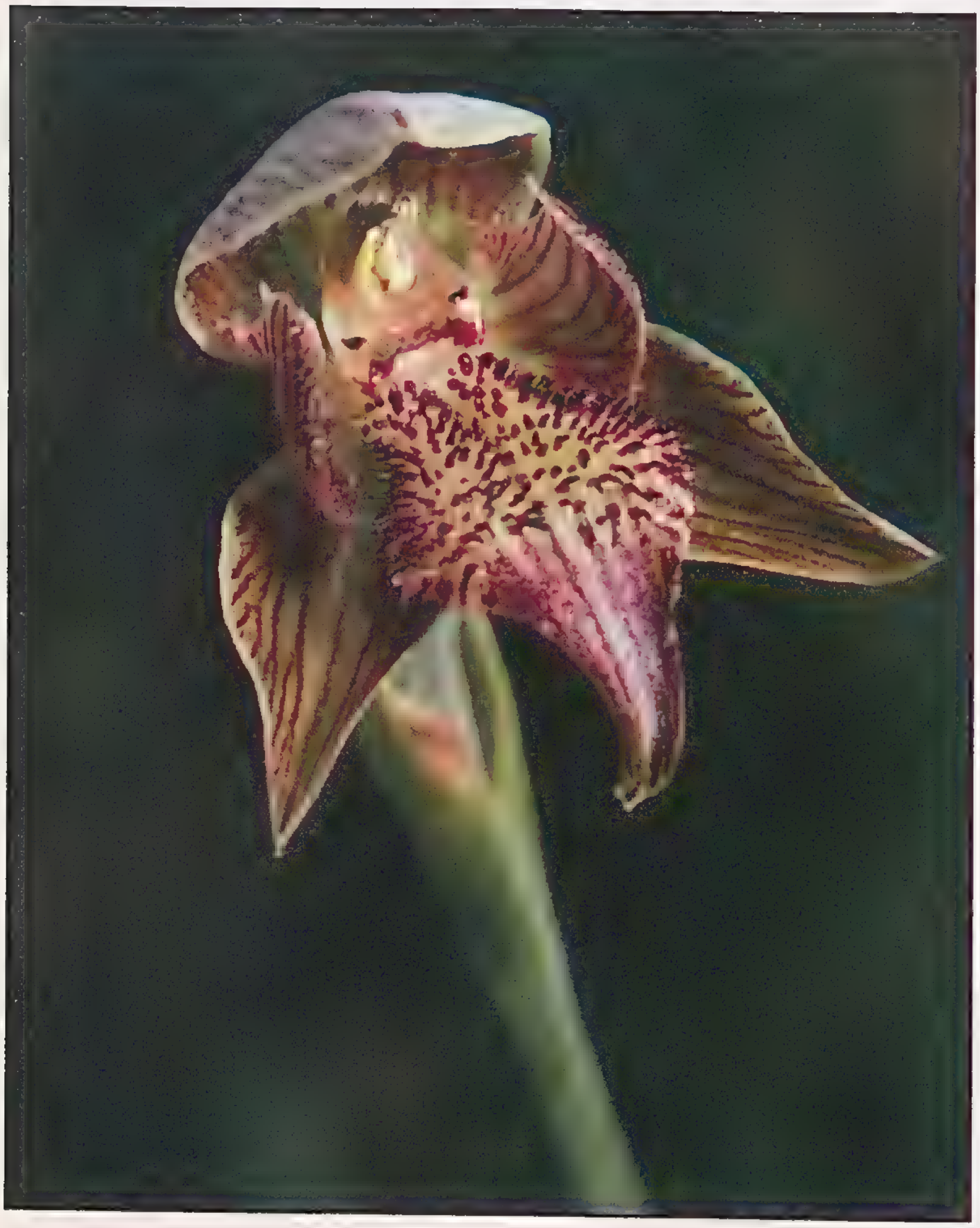
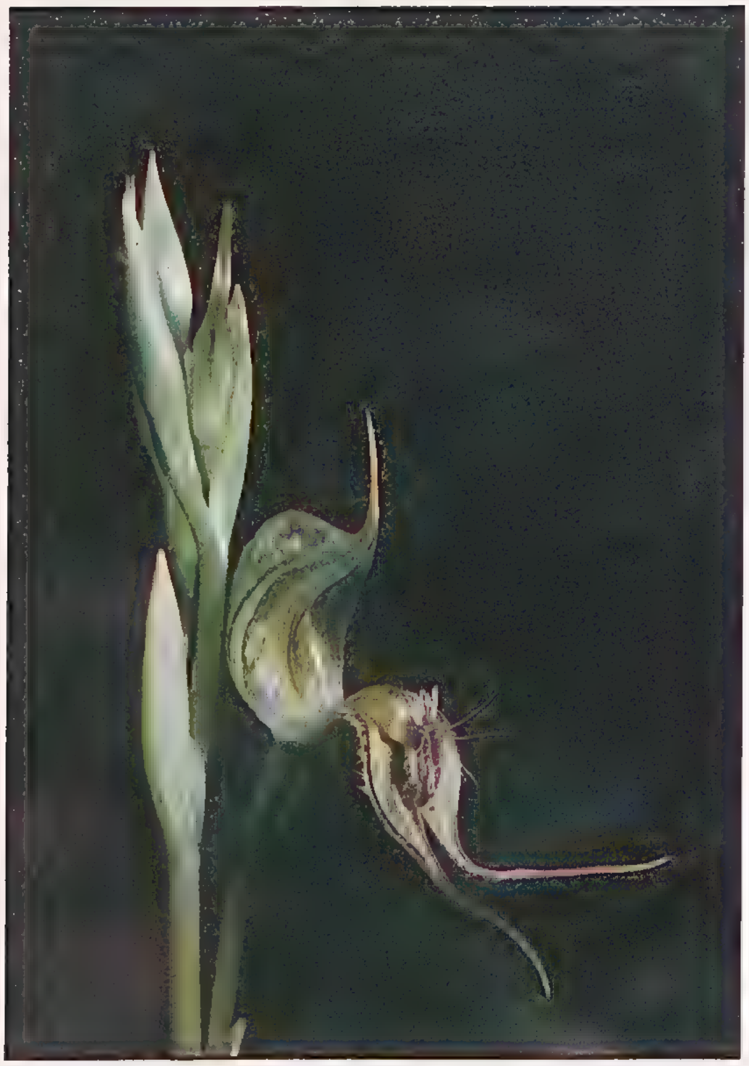
Introduction

Rushworth lies on the Northern side of the central Victorian gold fields. The history of the Rushworth area is intimately linked to gold mining, and its future is likely to be linked to that same elusive, precious metal with a recent spate of renewed exploration leases being granted. The most productive of the old abandoned mines was the Balaclava Mine at Whroo, a few kilometers to the south of Rushworth. The Whroo area has now become a tourist attraction with many hundreds of people being attracted to the Balaclava open cut mine every year. During the spring, this area of the Rushworth forest also draws orchid enthusiasts and those interested in wild flowers generally, with a magnificent display of blooms of both rare and common plants.

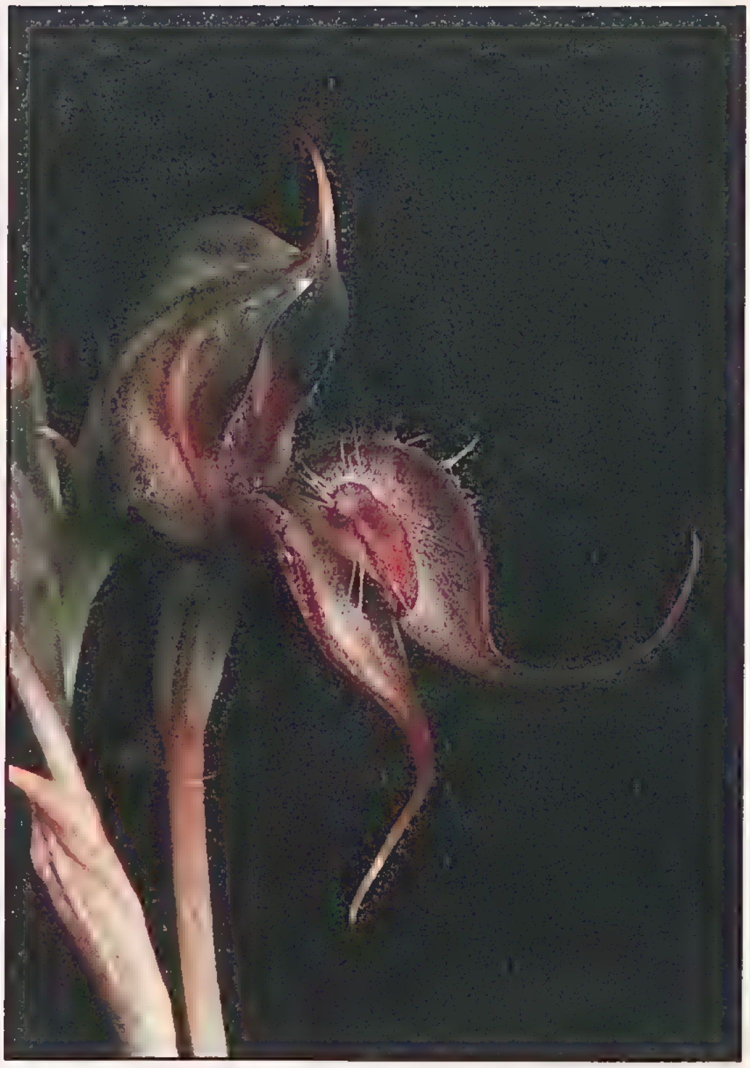
The auriferous soils support a dry, open forest dominated by red ironbark *Eucalyptus sideroxylon*. Other less uniformly widespread trees include grey box *Eucalyptus microcarpa* and yellow box *E. melliodora*. Areas of higher ground tend to be dominated by mallee trees such as bull mallee *E. behriana*, blue mallee *E. polybractea* and green mallee *E. viridis*. It is in such areas of mallee that large clearings of up to several hectares have been established to encourage the regrowth of juvenile leaves. These are harvested every twenty months or two years and processed to extract eucalyptus oil for commercial use.



Calochilus richiae Nicholls.



Pterostylis setifera M. Clements, I.G. Matthias *et* D. Jones.



Pterostylis boormanii* x *P. setifera

Orchid Flora

These ironbark forests and eucalyptus clearings are remarkable for the variety and quantity of terrestrial orchids produced each spring. The spring of 1988 was a particularly good year for terrestrial orchids, after a mild winter and regular rainfall. The observations recorded below were largely made during this period.

Pterostylis is the most varied and abundant genus of terrestrial orchids in the Rushworth forest, with at least sixteen different species represented. Within the genus *Pterostylis*, the rufa group is particularly well represented. Many species of this distinctive aggregation can be found growing associated with mallee trees, and appear to grow most successfully in those areas of mallee cleared for eucalyptus oil production. *Pterostylis boormanii* and *P. setifera* can be found growing abundantly in such cleared areas. Both species can be found growing together and apparent hybrids of the two can be observed. The hybrid appears to resemble *P. boormanii*, but has more numerous, white setae at the base of the labellum and around the margins, similar to those on *P. setifera*.

A botanical rarity for Victoria can also be found growing in close association with *P. setifera*. This is the spectacular *P. woollsii*, with its distinctive filamentous lateral sepals which can sweep down in excess of ten centimetres, to brush against the hard stony ground. The survival of these plants in areas regularly cut back during the harvest of juvenile leaves of the *Eucalyptus* species should not be totally unexpected. All members of the rufa group of greenhoods die back to the large subterranean tuberoids after seed release, and are thus protected from most events occurring at ground level. Their apparent abundance in these cleared areas of mallee may simply be due to the removal of the plants that normally shelter them from the casual observer. Alternatively, fewer competitors in cleared areas may make it easier for members of the rufa group to survive and multiply successfully.

Other members of the rufa group that can be observed in the Rushworth forest include *P. rufa, P. pusilla* and *P. maxima*. Of this group *P. maxima* is the least common. It is closely related to *P. biseta*, sharing the two, distinct, long white setae that project forward from just below the base of the labellum. However, its flowers are larger and of a distinctly brown coloration. The small group of *P. maxima* observed consisted of four plants only, and all had failed to set seed. The largest and healthiest specimen was attacked by a small animal that burrowed down to the tuberoid and consumed it before the reproductive cycle had been completed. These plants grew in close proximity to *P. pusilla*, but flowered later.

The Whroo cemetery can be found about one kilometre from the visitor's centre near the Balaclava open cut gold mine. Here is a lasting monument to the miners and their families, providing a mute testament to the hard life and paucity of medical help in the early Victorian gold fields. Close to this cemetery is the Aboriginal waterhole, a permanent soak that provided water for the aborigines living in the general vicinity. This is an area particularly rich in a wide variety of terrestrial orchids, and certainly worth a visit during the springtime. In early September, *Pterostylis nana, P. nutans, Caladenia carnea, C. caerulea, Acianthus exertus, Cyrtostylis reniformis, Glossodia major* and *Diuris maculata* can be observed growing in profusion. Later, in mid to late September and early October, other terrestrials begin to flower, and so attract the attention of the orchid enthusiast. *Pterostylis cycnocephala, Caladenia dilatata, C. cucullata, C. gracilis, Microtis unifolia* and *Calochilus robertsonii*, all add their distinctive blooms to the wealth of terrestrial orchids already flowering in the area.

In some of the earlier flowering species, it appears that later flowers may sometimes differ from the flowers observed earlier. This appears to be the case with *Caladenia carnea*; later flowers in the Whroo area are generally more robust, and commonly two flowers are produced per plant.

The so-called sun orchids begin to flower later in Spring. *Thelymitra nuda, T. pauciflora, T. rubra, T. ixioides* and *T. antennifera* can all be seen growing in this area. At the top of the aboriginal waterhole, *Diuris sulphurea*, with its distinctive yellow and brown flowers, can often be found growing out of a protective tussock of coarse, native grass. At this time, the first of the *Caleana major* plants begin to flower on the southern side of the hill and towards the bottom of the hill. These orchids are regularly eaten off by browsing animals before they flower. In one attempt to protect these plants before flowering, a dead bush was placed over eight or so young orchids. They had good protection from kangaroos and wallabies which are common in the area, but all plants were eaten before flowering. Mutilation of the leaves suggest that snails or slugs may have been the culprits in this case.

The shallow, stony soils supporting much of the Rushworth forest also support such botanical rarities as *Calochilus imberbis* and *Calochilus richiae*. The last named plant was named after its discoverer, Mrs Rich, a one-time resident of Rushworth and is endemic to the Whroo area of the Rushworth forest. Unfortunately, this rare plant with its hairless labellum covered with short, purple calli, is in some immediate danger of extinction. Each year it becomes more endangered; in 1987 several plants were dug out by unthinking, selfish collectors and the population has dwindled to less than a dozen individual plants. Such rarities must be protected at all costs and every effort must be made to develop successful cultivation techniques for the genus *Calochilus* generally.

Acknowledgement

Knowledge is only gained through persistent endeavour and experience and is a precious commodity not always shared readily. I have been fortunate to know two people who have willingly shared their experience and knowledge of the Rushworth forest with me. Ted and Cynthia have developed an intimate knowledge of the forest's flora over the years and share a concern for its future with other genuine lovers of things natural. These brief observations are as much theirs as they are mine.

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NEW AND NOTEWORTHY ORCHIDS FROM THE NORTHERN TERRITORY

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Abstract: *Phaius pictus, Spathoglottis paulinae* and *Zeuxine oblonga* are recorded from the Northern Territory for the first time. Information pertaining to habitat, distribution and collection data is presented. Recent collections of *Didymoplexis pallens, Nervilia aragoana*, an undescribed *Nervilia* sp. and *Pachystoma pubescens* are also discussed.

INTRODUCTION

The Flora of the Northern Territory (Ewart and Davies 1917) recorded eleven species of orchids from eight genera. Chippendale in his checklist of Northern Territory plants, listed 16 native orchid species from 9 genera (Chippendale 1972). Simmons (1979) recorded 27 species from 13 genera in his *Checklist of Orchidaceae in the N.T.*. The recently published *Checklist of Vascular Plants of the Northern Territory* (Dunlop 1987) listed 32 orchid species from 17 genera. This publication excluded some well known but undescribed species (e.g. *Nervilia* sp. and *Habenaria* sp.). Many of these new discoveries resulted from field work carried out by David Jones in preparation for his forthcoming treatment of Northern Territory Orchidaceae.

Since the publication of the 1987 checklist and the cessation of Jones' field studies, several orchid taxa have been recorded from the Northern Territory for the first time. These new records and certain other recent noteworthy orchid collections are detailed in this paper.

All collections cited are housed at the Darwin Herbarium (DNA), Conservation Commission of the Northern Territory.

NEW RECORDS

Phaius pictus Hunt

Erect terrestrial orchid to 1.0 m high; stems slightly swollen at base; leaves lanceolate, 40-65 cm x 6-10 cm, plicate; inflorescence erect, 50- 90 cm long; buds yellowish, 2-4 cm long; flowers not observed.

Collection details: Habgood River, Arnhem Land, 12°39'S 135°51'E, *C.R. Dunlop* 7435, 3.xii.1987. Catchment of Habgood River, Arnhem Land, 12°39'S 135°52'E *J. Russell-Smith* 4357, and *D. Lucas*, 3.xii.1987 (Fig. 1).

Habitat: Densely shaded monsoon vine forests fed by perennial springs; soils loamy with high humus content, remaining moist or swampy at all times of the year.

Locality: The two collections of *Phaius* were made from monsoon vine forests less than 500 m apart, near the Habgood River in north east Arnhem Land. These two sites represent the only known populations of *Phaius* in the Northern Territory, although it is possible that more populations exist in the vicinity since this area is relatively unexplored botanically.

Notes: The specific name of this taxon is uncertain. It may represent a new species or a new record of *Phaius* for Australia (D.L. Jones pers. comm.). Of the currently known Australian *Phaius*, it is most closely allied to *P. pictus* Hunt, which occurs in Queensland.

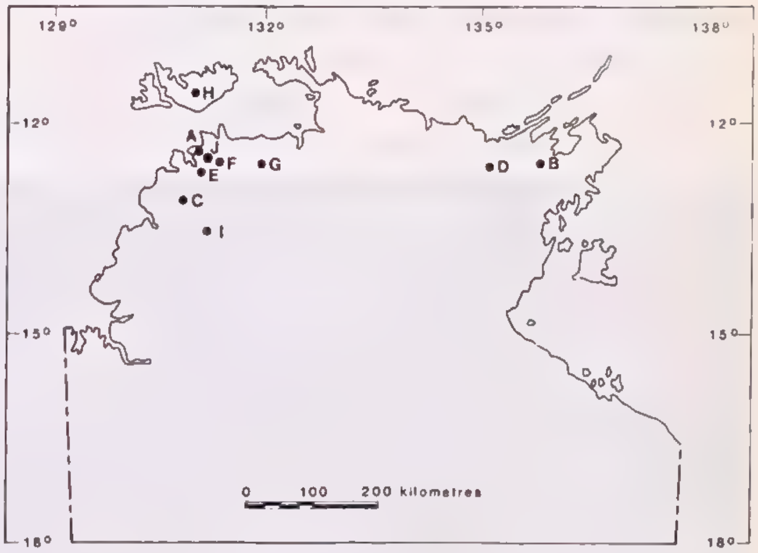
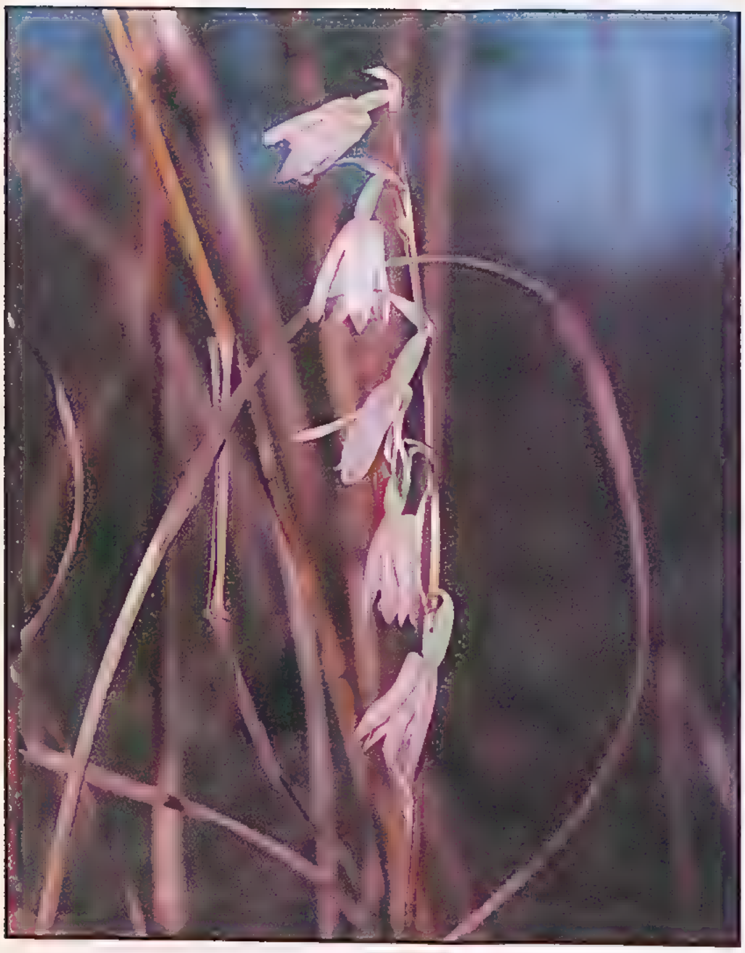
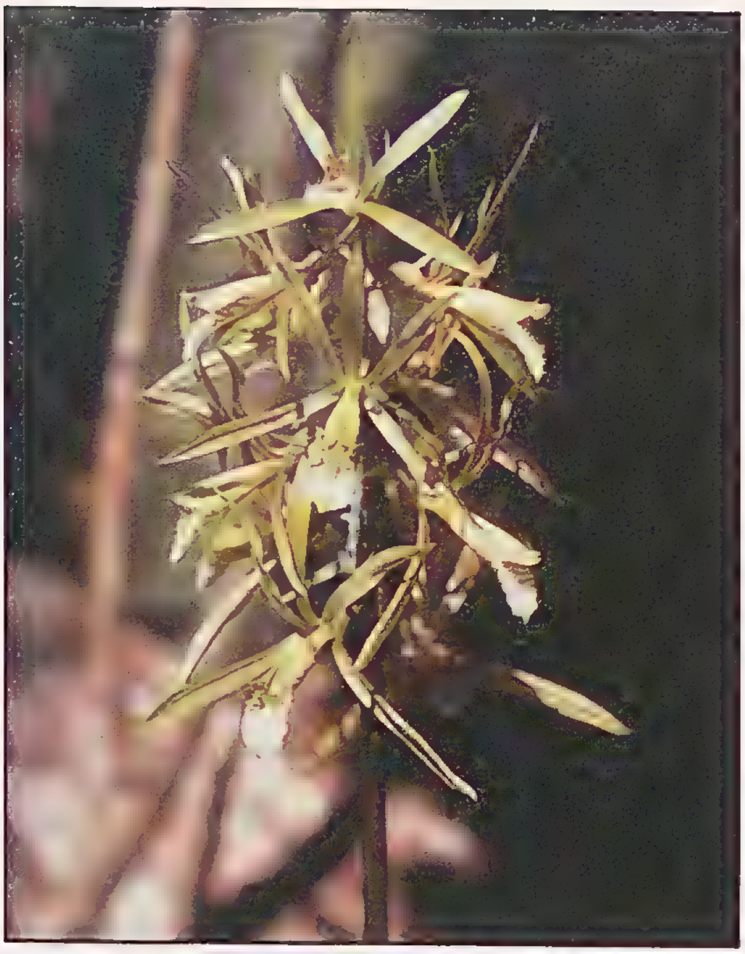


Figure 1. Orchid Localities, Northern Territory

A : Darwin
B : Habgood River: *Phaius pictus, Spathoglottis paulinae*
C : Pethericks Rainforest: *Zeuxine oblonga*
D : Mirrngadja: *Didymoplexis pallens*
E : Berry Springs:
F : Black Jungle: *Nervilia aragoana*
G : Leichhardt Creek:
H : Hanguana Jungle: *Nervilia* sp. nov.
I : Green Ant Creek:
J : Virginia Area: *Pachystoma pubescens*

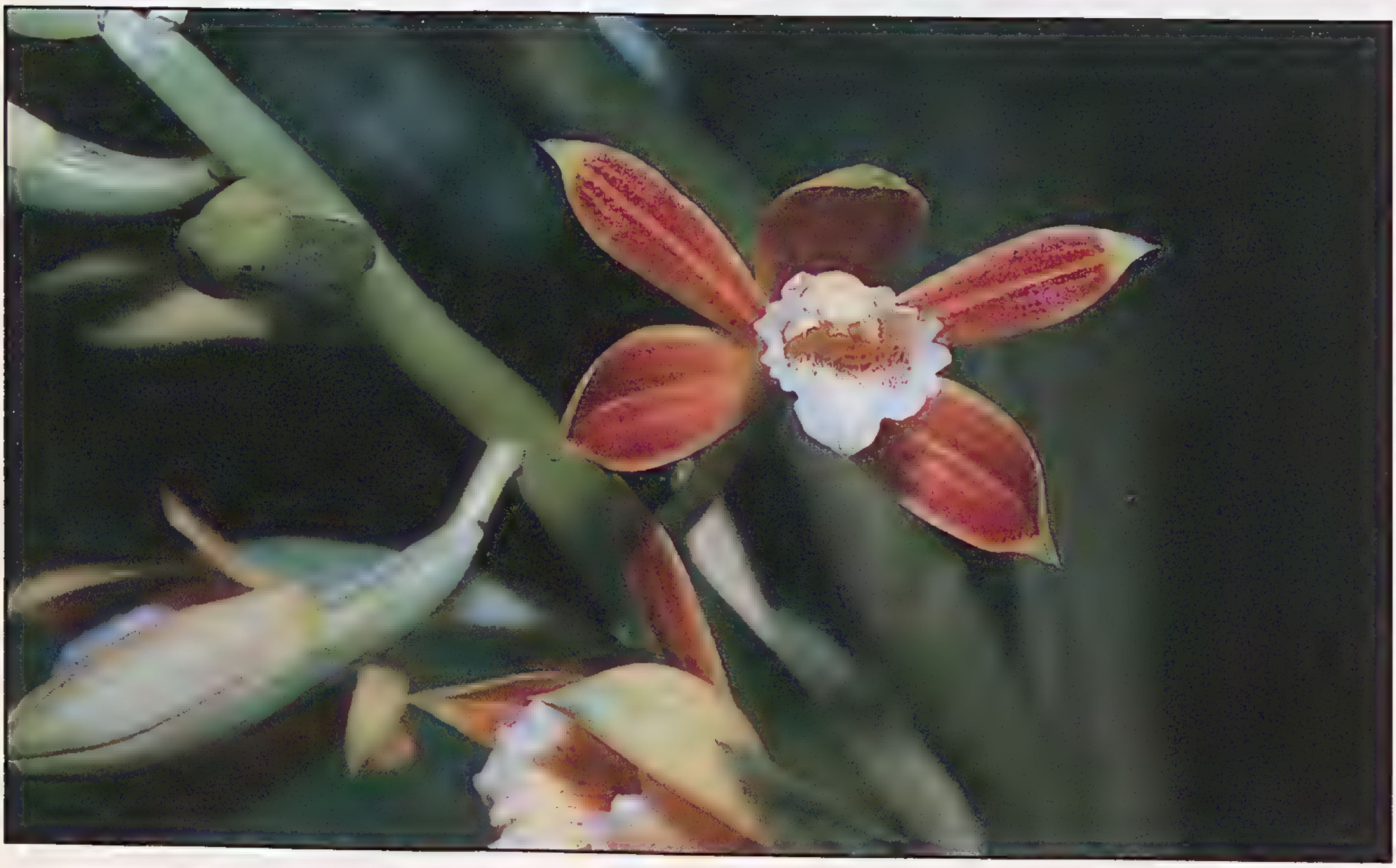


Pachystoma pubescens Blume (*P. holtzei* (F. Muell.)F. Muell.) Photo - G. Wightman



Nervilia aragoana Gaud.. Photo - P. Jarver

Phaius pictus Hunt. Photo - M. Webb



Spathoglottis paulinae F. Muell.

Terrestrial orchid to 1.5 m high, semideciduous; leaves lanceolate, 30- 60 cm x 1-5 cm, plicate, tapering to petiole; inflorescence to 1.2 m long; flowers closely packed, 2-4 cm diameter, deep mauve, few open at any one time.

Collection details: Catchment of Habgood River, Arnhem Land, 12°39'S 135°52'E, *J. Russell-Smith* 4356, and *D. Lucas*, 3.xii.1987; (Fig. 1).

Habitat: Edge of monsoon vine forest in shaded and open areas; soil humic loam to 10 cm over sand; area seasonally swampy but well drained.

Locality: This collection of *S. paulinae* represents the only known population of this species in the Northern Territory, and was collected from the same area as the previously discussed *Phaius* collections. Similarly, the possibility of further populations being found in the area is evident.

Notes: Two species of *Spathoglottis* are known from Australia. Both were previously considered to be restricted to Queensland. The collection of *S. paulinae* from the Northern Territory was in flower. The corolla was a deep mauve colour.

Zeuxine oblonga R. Rogers and C. White

Single stemmed terrestrial orchid to 45 cm high; annual aerial shoot from perennial rootstock; leaves few, ovate, 3-8 cm x 1-3 cm, pale green, sheathing stem; inflorescence 5-30 cm long, densely hirsute; flowers clustered at apex of inflorescence, 4-6 mm wide, pale green to white, hairy (Fig. 2).

Collection details: Pethericks Rainforest, 80 km SSE Darwin, 13°07'S 130°25'E, *G.M. Wightman* 3066, 24.ix.1986 (Fig. 1).

Habitat: Dense monsoon vine forest; soil black, sandy loam, humus rich, very moist; fed by perennial spring.

Notes: This collection represents the only known population of *Z. oblonga* in the Northern Territory. Only two plants were observed in the area which had been extensively routed by feral pigs. *Z. oblonga* is endemic to Australia, occurring on the east coast of Australia from northeastern New South Wales to northeastern Queensland.

NOTEWORTHY COLLECTIONS

Didymoplexis pallens Griffith

Saprophytic terrestrial orchid, rhizome tuberous, 4-8 cm long; inflorescence 5-12 cm long, yellowish, bracteate; flowers 8-12 mm wide, white, opening singly, short-lived.

Collection details: 19 km north of Mirrngadja, Arnhem Land, 12°30'S 135°19'E, *G.J. Leach* 1551, and *C.R. Dunlop*, 5.xi.1987. Bulman Gorge area, Headwaters of Wilton River, 13°09'S 134°12'E, *G.J. Leach* 1671, 11.xi.1987 (Fig. 1).

Habitat: Monsoon vine forest; seepage area of sandstone breakaway.

Notes: *D. pallens* has previously been reported from sites in Arnhem Land and near Darwin. This collection represents the only record of *D. pallens* from the Northern Territory this century. *D. pallens* survives the dry season as a dormant tuber in a symbiotic association with a mycorrhizal fungus. Flower stems emerge after the first rains of the wet season and seed is shed within a few days of flowering (Jones 1986). This brief period of above ground activity, coupled with the small inflorescence, lack of leaves, and its occurrence in an area that receives little botanical attention, could explain the small number of collections of this species in the Northern Territory. *D. pallens* also occurs in North Queensland and northeastern Western Australia, and extends through Indonesia and Malaysia to India (Dockrill 1969).

Nervilia aragoana Gaud.

Deciduous, terrestrial orchid; tuber fleshy, 1-2 cm wide; leaf solitary rounded-cordate, 15-25 cm diameter, venation radiating, petiole 10-20 cm; inflorescence 15-30 cm long, 2-6 flowers; flowers green-cream with purple striations, 4 cm wide.

Collection details: Berry Springs, 30 km SSE Darwin, 12°41'S 130°59'E, *M.J. Clark* 24, and *G.M. Wightman*, 18.x.1985, Leichhardt Creek, Wildman River area, 12°36'E 131°58'S, *J. Russell-Smith* 2353, and *D. Lucas*, 15.v.1987. Black Jungle, 45 km ESE Darwin, 12°33'S 131°14'E, *G.M. Wightman* 1161, 10.v.1984. Black Jungle, 45 km ESE Darwin, 12°33'E 131°14'S, *D.L. Jones* 1327, 4.ii.1984 (Fig. 1).

Habitat: Monsoon vine forests and margins; soil black, clay-loam, humus rich, from perennially moist to seasonally dry.

Notes: *N. aragoana* is known from three areas in the Northern Territory, viz: Black Jungle, Berry Springs and Leichhardt Creek. In each of these areas, the populations of plants are relatively large.

N. aragoana survives the dry season as a dormant tuber. Inflorescences are produced at the beginning of the wet season, from October to December, followed by leaves which persist until April or May.

Individual flowers are green-cream with purple striations and emit a slightly pungent aroma. Small flies visit the flowers, apparently attracted by the odour.

N. aragoana also occurs in India, Malaysia, Indonesia, New Guinea and Queensland.

Nervilia **sp. nov.**

Deciduous terrestrial orchid; tuber 0.5-1.0 cm diameter; leaf solitary, orbicular, peltate, 2-4 cm diameter, bluish-green, venation radiating, ground-hugging; inflorescence and flowers unknown.

Collection details: Hanguana Jungle, Melville Island, 11°32'E 130°59'S, *D. Jones* 1339, .ii.1988. Green Ant Creek, 135 km SSE Darwin, 13°36'S 131°12'E, *N. Byrnes* 1669, 06.iii.1970 (Fig. 1).

Habitat: Amongst grass in open forest, soil fine grained; area commonly burnt *Jones* 1339; rainforest *Byrnes* 1669.

Notes: This species of *Nervilia* has, in the past, been referred to as *N. uniflora* (Clements 1982), but in fact represents an undescribed species of *Nervilia* (D.L. Jones, pers. comm.). It is known only from the two localities cited above in the Northern Territory, but also occurs in North Queensland, and is apparently endemic to Australia.

Pachystoma pubescens **Blume**

Terrestrial orchid; aerial parts annual; rhizome perennial, subterranean, fleshy. Leaf grass-like, plicate, 25-40 cm x 1.0 cm. Inflorescence to 30 cm high, flowers 5-10. Flowers nodding, pink, 1-1.2 cm long, not opening widely; disc of lip bright yellow-green.

Collection details: Virginia area, 25 km SE of Darwin, 12°33'E 131°01'S, *G.M. Wightman* 4538, and *C.R. Dunlop*, 31.viii.1988 (Fig. 1).

Habitat: Amongst dense grassy understorey in low open woodland, near ephemeral stream with *Panganus spiralis*, soil brown, silty.

Notes: *Pachystoma pubescens* had not been collected in the Northern Territory since Nicholas Holtze collected the first specimen from 'Port Darwin' last century. *P. pubescens* also occurs in northeastern Queensland (Clements 1982) and is widespread outside Australia. This species was described as *Pachystoma holtzei* by Mueller, but recent studies have shown this material to be identical to overseas material for which the earliest name is *P. pubescens* (Jones 1988).

The nodding pink flowers are well camouflaged amongst the grassy understorey and the leaves are grass-like. These features, combined with the late dry season flowering, are probably the main reasons for the low number of collections of this species.

ACKNOWLEDGEMENTS

David Jones is thanked for identifications and general advice, Clyde Dunlop for suggesting the paper, Susannah O'Brien and Dorothy Hunter for typing the manuscript, Jane Meiklem for preparing the figure and Milton Andrews for drawing the plate.

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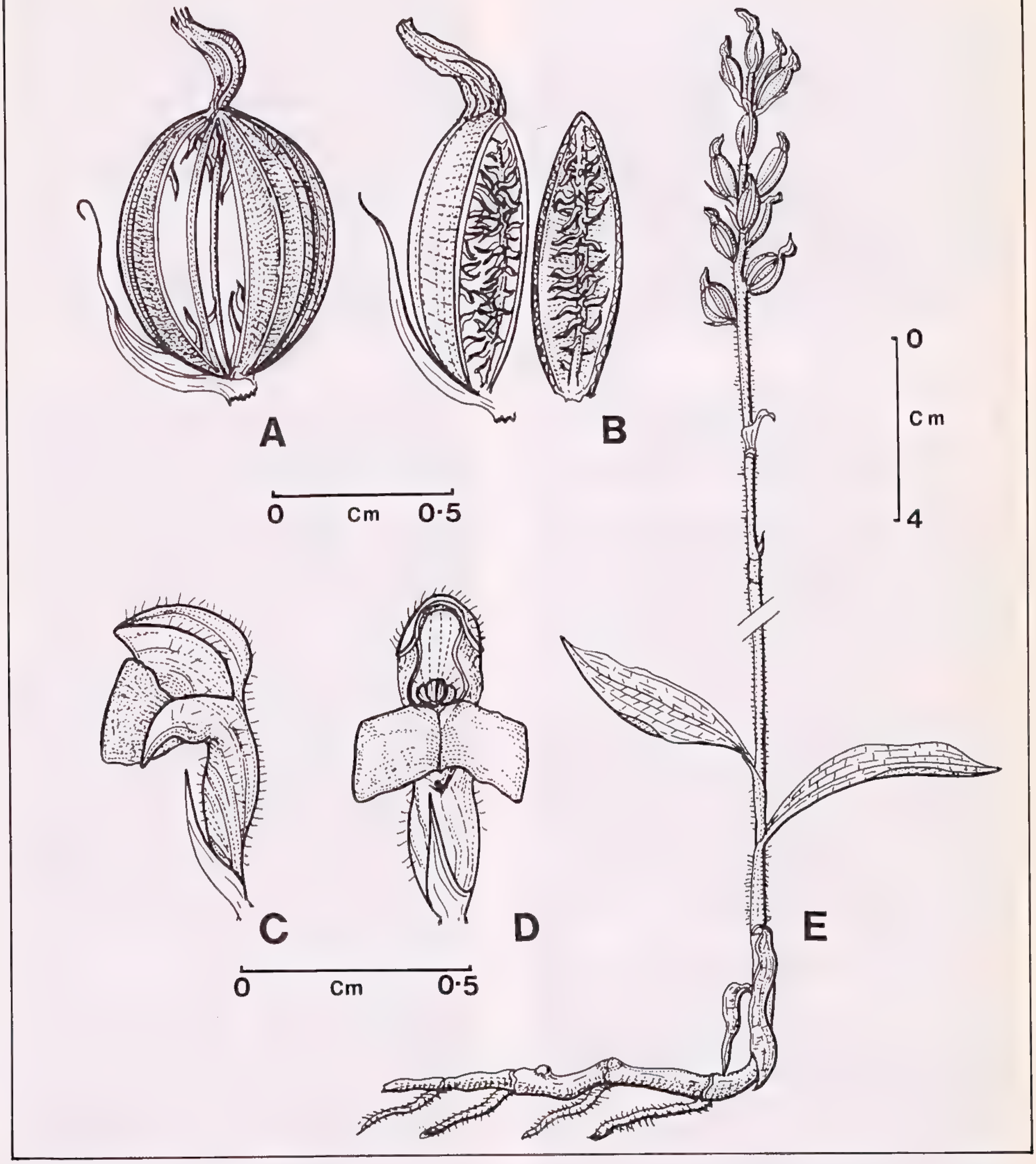

FIGURE 2. *Zeuxine oblonga*
A fruit : B dissected fruit : C flower from side : D flower from front : E habit : (A–E, G.M. WIGHTMAN 3006, DNA)

THE ORCHADIAN - PAST, PRESENT AND POSSIBLE FUTURE

J.J. Betts
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When I took over the Presidency of A.N.O.S. from Eric Gordon in December 1975 (see Vol.5, No.3) I realised that the Journal of the Australasian Native Orchid Society was more important than the presidency. By December 1977 I was both President and Editor; so that the gradual changes I had imposed between 1975 and 1977 on the contents of the journal became more apparent. Readers who own a complete set of past issues will see that the main changes were:

-Printing replaced the typewriting
-Colour appeared on the front cover
-Layout and design in blue had led to my drawing the blue *Thelymitra ixioides* as a kind of emblem for the cover
-An "Editorial" appeared for the first time
-Contents were indicated on the cover along with a forecast of future important articles
-"Letters to the Editor" were featured as a stimulus for critical comment

My dual role as Editor and President continued until September 1978 when I shed the duties of President and concentrated exclusively, as Editor, on the further improvement of *The Orchadian*. What had been achieved to that date was possible only because of the support from writers such as Neville Howcroft on the scientific side and Ted Gregory on the side of orchid cultivation. So far as the Society's management was concerned I was most grateful to Phil Collin as Treasurer. I recall that Phil and I set a target to increase the subscriber membership of A.N.O.S. from around 500 to one thousand. We "progressed" this in monthly reports to Council and achieved about 900 by the time my presidency ended in 1978.

The changes listed above were maintained throughout Volume 6 (1978 to 1981). On a trip to England in 1979, I visited Kew Gardens and met Dr P.J. Cribb, the leading orchid botanist. I learned that *The Orchadian* was highly regarded there and in other parts of Europe. So I was content with the new format for the time being. We had achieved our changes by selling a limited amount of advertising space, but we were still limited by funds to the use of one colour. I changed the colour for each quarter and this necessitated the drawing of a new orchid emblem for the cover to suit the colour-change for each quarter. By the end of Volume **6** it was clear that the new-look *Orchadian* was attracting certain authors who formerly had been reluctant to publish their new species in what looked like a club newsletter.

One thing leads on to another. Scientific writers who were describing new orchid species needed to put their "diagnoses" into Latin, the international language of botany. I was pleased to do this for them whenever it was necessary. Because of the inclusion of orchid-rich Papua New Guinea within the geographic scope of Australasia, it will be realised that our journal carried descriptions of more new species than one might expect.

By the end of Volume **6** in June 1981, I was in a position to produce a General Index in four sections: (i) Authors (ii) Subject matter (iii) Orchid genera, species and hybrids, and (iv) New species. This last section revealed that in Vol.6 no less than 14 new taxa (species, sub-species or varieties) had been described by S.C. Clemesha (2), T.M. Reeve (3), P.J. Cribb (8) and N.H.S. Howcroft (1).

Having produced *The Orchadian's* first index, I felt that Volumes 1-5 should also be indexed if they were to be accessible to future study. This need was met by John S. Womersley of Adelaide (formerly Chief Botanist for Papua New Guinea) who offered to compile a consolidated Index to Volumes **1** to **5** (1963 to 1978). This formidable task was completed and published by August 1984. It was a thoroughly professional work of 36 pages. Sadly John Womersley died before it was printed; but it now stands as a lasting memorial to his great generosity to A.N.O.S. and *The Orchadian.*

We had come a long way in three years, and the pattern was set for Volume 7. I continued with my "new-look" format but redesigned the front cover to spread an illustration of a complete orchid plant over the whole space, superimposed over the printing of the contents. My "Editorial" in Volume **7** Number 1 shows that there were some members who disapproved of the inclusion of Papua New Guinea and New Zealand and some who wanted to exclude scientific articles in favour of orchid cultivation and "how to make them grow". Critical comment had been encouraged by me, so it was necessary to reply. Therefore the next editorial referred to the need to maintain a balance between horticulture and scientific botany. I did not say, however, that the two categories would have *equal* weight. Experience had taught me that we could expect more contributions from scientists than from hobbyists; and this was as it should be in a reputable scientific journal. In any case I had become more concerned with the need for conservation of our orchids in their natural state than with how to cultivate them after plundering the wild. Volume 7 included an article by Phil Cribb on symbiotic conservation at Kew as well as a series of hard-hitting pieces by Gerry Walsh from his experiences in close touch with the bush of New South Wales.

In Retrospect

Perhaps the quickest way to appreciate what happened in those years of *The Orchadian's* most striking development is to look through just one or two issues in Volume 7 (say Numbers 9 and 10). In Number 9 we find the first use of full colour photographs in the centre pages. The "Editorial" page is worth re-reading now because it speaks of our financial needs in getting the Index to Volumes 1-5 printed. It considers the possibility of sponsorship but says defiantly: "We shall do it anyway". There is an important article from Tom Reeve - a revision of one of the Dendrobium sections and a description of a new species, *Dendrobium margaretae* T.M. Reeve. This is followed by a conservation article by Gerry Walsh and another by Garry Wells on the problems of Lord Howe Island and its "disturbed equilibrium". Then comes a paper by Brian Molloy and John Johns on a new orchid record for New Zealand (*Chiloglottis gunnii Lindley*). This is followed by a note by myself on a new species for New Zealand named by Dorothy Cooper (*Pterostylis cardiostigma* D. Cooper sp. nov.). Michael Harrison then presents the seventh in his excellent series "Cultivation Based on Habitat Observation". (I still see that series as the basis for a book that Mike could write). Another "Conservation" article from Gerry Walsh is then followed by the quarterly list of new Australasian hybrids registered by the R.H.S. The issue concludes with a taxonomic note by myself on "Two New Genera and a New Species for New Caledonia" and finally, a controversial "Letter to the Editor".

The other sample issue to look at is Volume 7 Number 10 (December 1983). The two centre pages contain *The Orchadian's* first fully coloured, illustrated article by Garry Wells, using his own slide photographs taken at the A.N.O.S. Ninth Annual Spring Show. This was the ultimate achievement of my aims for *The Orchadian.* My "Editorial" asks "What next? What about a new editor for The Orchadian?" We had been through a very creative period and I had enjoyed every step forward. Now it was time to take a rest. A.N.O.S. Council had conferred Life Membership on me at its Annual General Meeting in 1982. I gave due notice of my wish to retire on completion of Volume 7 (and its index) in June 1984 - which happened to mark the 21st birthday of A.N.O.S.

The Present

I suppose "the present" should cover the state of *The Orchadian* between 1984 and the present day. Volume 8 began with two new editors: Margaret Spence and Michael Penberthy. Their stewardship continued throughout that volume to June 1987, maintaining the same format in almost every detail. And, of course the same high quality contributors continued throughout. The balance between botanical and horticultural papers was also maintained. Major differences were in the omission of an "Editorial" and "Letters to the Editor" as regular features.

The first issue of Volume 9 (September 1987) was put together by an "editorial committee" pending Noel Grundon taking over the job of Editor in time for the second issue (December 1987). It was good to see, at last, the editorship move out of Sydney to another State, Queensland. Noel restored the "Editorial" and Letters to the Editor (as "Readers' Forum") and clearly retained the professional format already established. There was a new cover design using the attractive drawings of R.D. Fitzgerald in his "Australian Orchids" of 100 years ago. I regard this as a very appropriate design improvement. However it is a cosmetic change and *The Orchadian's* contents and format are basically the same as before - in an excellent balance between science and horticulture. Clearly it is the contributors, as the Editor says, who make a journal's contents of high standard; but now we have a substantial grant from the Australian Orchid Foundation and the effects of this on format are striking. *The Orchadian* Volume 9, Number 9 (September 1989) has colour photographs spread throughout and on its covers.

In Prospect

The future must grow out of the past; so that we can learn from the past. As I look at the two most recent issues (Volume 9, Numbers 8 and 9) I have nothing but praise for our present Editor and his production co-ordinator Mark Webb. There are now six or more pages of high quality colour photographs to illustrate the articles of writers like Len Lawler, Ian St George, Jeff Jeanes, Norman Cruttwell, and Bob Bates. As for the articles themselves: their range of interest is very satisfying to me. If I may single out one of the writers new to me, let it be Ian St George (Dunedin N.Z.) whose short historical paper, "Who Drew *Calochilus campestris*?" was right up my alley - with a beautiful coloured lithograph from Curtis's Botanical Magazine of 1832! It pays due deference to history.

So what can I ask for in the "possible future"? More of the quality found in these last two issues. When I signed off in my final Editorial I wrote "I hope *The Orchadian* will continue to give us the unexpected"; and I have not been disappointed. If I am to find something to criticise it will have to be fairly minor. Before I took over the editorship I put it to A.N.O.S. Council that we ought to change the name from *The Orchadian* to *The Orchidean* or *Orchidian.* The first of the three is not an English word. For some people it betrays an amateurish disregard for proper English usage -perhaps even to the extent of illiteracy. Why not *The Orchidian*? This word was used by the Rev. H.M.R. Rupp in his correspondence with Fordham to denote an orchid enthusiast.

Another suggestion for the possible future would be to use colour reproductions of the drawings of talented botanical artists like Collin Woolcock. Photographs are fine, but art work can be finer.

O

ANOS AWARD.

Dendrobium David Baver 'Monroe' was granted a HCC at the ANOS Autumn Show on the 29th April,1990. This excellent plant, owned by Laurie Jarvis, was Grand Champion of the Show. Further details will be published in *The Orchadian* , Vol. **10** no 1.

A New Direction for *The Orchadian?*

When Noel Grundon took on the job of editor with Volume **9** No. 2 and I took on the job of production co-ordinator, neither of us knew much about producing a magazine. We inherited a 20 page magazine, with a colour centre spread and cover. We now have a 32 page magazine with 8 pages of colour and are looking to increase this further.

Since taking on the job of preparing *The-Orchadian* for printing we (Allison and I) have become aware of a number of faults and problems with the magazine. The major problem is the outdated, quarto size, adopted in 1965. This size has become less common and continuing its use will result in wasting paper. What we intended to do is reduce the size of the magazine slightly. This will not effect the amount of text per page and will allow more pages to be printed together on a single sheet (16 compared to the current 8), resulting in reduced costs. Another added benefit is that the magazine should not be folded in the post (as would occur if we increased to the alternative size, A4).

What we hope to produce is a magazine which contains something to interest everyone. To do this it is not necessary to radically alter the content of the magazine, but rather to tidy up the edges. It is to this end that the questionaire is enclosed with the subscription notice. The development of the magazine is an ongoing process and what we hope to achieve is an interesting, quality magazine which is appealing to read.

Another change will be to alter the months of publication. At present we are producing issues in September, during the major show season, December which coincides with printers holidays from mid-December to mid-January, March and June.

No matter what we do, one thing is essential and that is support and input from our readers. If you have something to contribute, no matter how short we would be glad to hear from you.

Mark Webb

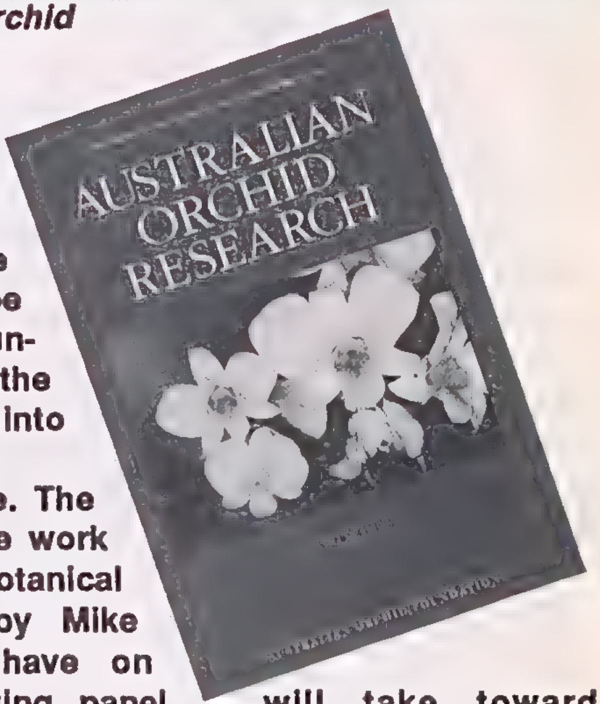
O

REVIEW

Catalogue of Australian Orchidaceae; *Australian Orchid Research* 1, 1-160. By M.A. Clements. Soft cover; 17 cm x 25 cm. Published 1989 by the Australian Orchid Foundation, 107 Roberts Street, Essendon, Victoria 3040. Price $19.50 within Australia, $22.50 outside Australia.

This article takes up the whole of the first volume of the new journal, *Australian Orchid Research* ,which will be published occasionally by the Australian Orchid Foundation as material becomes available. The content of the journal will deal with results of scientific research into Australian Orchidaceae.

The following is a series of comments on this catalogue. The first is by our editor, Dr. Noel Grundon who looks at the work from the hobbyist point of view. The second is a botanical comment from Dr. Ben Wallace and the third is by Mike Harrison who considers the effect this work will have on judging and summarises the attitude the ANOS Judging panel will take toward this work. We hope that these comments will help readers make an informed decision as to their stance on this long-awaited publication.



The article by M.A. Clements, *Catalogue of Australian Orchidaceae*, is the long-awaited follow-up to Clements' *Preliminary Checklist of Australian Orchidaceae* (Clements 1982). In his checklist, Clements attempted to bring together in one publication, local and overseas information on the accepted names of Australian native orchids, current to May 1982. In his Introduction, Clements commented ... "With further taxonomic research this checklist will require change and the author invites comments to aid future revision." That revision is evident in the number of nomenclatural changes listed in this catalogue.

The status of all Australian Orchidaceae has been reviewed. Twenty-six new species are described and the status of forty-one taxa has been changed. The intergeneric hybrid, *X Calassodia*, is described as new for a natural cross between *Caladenia* and *Glossodia*.

These changes have came about only after much research and painstaking examination of herbarium specimens and freshly collected material, often from the same locality as the original type specimens. Clements is to be congratulated for the effort and dedication he has brought to this revision of the orchid taxa of Australia.

Since I am not a taxonomist, I cannot comment on the correctness, or otherwise, of the taxonomic decisions made by Clements. The methods he used in reviewing the relevant literature, exploring herbaria for material on type specimens of a taxon, and field research to determine the correct identity of named taxa, are those I would expect to encounter in all scientific research that has been correctly undertaken. However, I note with interest the following two points:

The rank of a taxon: ".... the principle that most taxa, (i) with more than one or (ii) with several difference(s) in morphology and biology, should be ranked as species."; and

The consequence of this definition of a taxon: "... is that a number of taxa have been raised to species rank and very few taxa below the rank of species are recognised herein."

The correctness of Clements' decisions will be judged by Clements' peers within the taxonomic field; it is not hobby growers who will made this judgement. It must be recognised by hobbyists that scientific research is not automatically accepted as gospel truth; it must be tested, examined and authenticated by the peers of the author before it will be accepted by the scientific body at large. For example, the treatment of *Dendrobium* by Brieger (1981) has been examined by the larger body of taxonomists working within the Orchidaceae, and is now generally accepted as incorrect. Similar examination by taxonomists will occur over the next few years of the changes suggested by Clements for the nomenclature of the Australian Orchidaceae, and it is only then that the final assessments on the correctness of Clement's decisions will be known. Clements accepts that further study and research of the taxonomy and classification of Australian orchids will bring about changes to the nomenclature he suggests in his article, but suggests that such changes will be fewer in number. Time alone will tell if this statement is correct.

I believe that Clements' treatment of the nomenclature of Australian orchids causes only one problem for devotees of Australasian native orchids, *viz.* what name to put on the label. The grower can accept immediately and without question, the name changes suggested by Clements and go ahead and change all the labels to the new names. A more cautious grower might decide to wait a bit; after all, everybody did not dash into their orchid house and change the name of *Dendrobium rigidum* to *Dockrillia rigida* as Rauschert suggested in 1983, or *Dendrobium speciosum* to *Dendrocoryne speciosa* as Brieger suggested in 1981.

For the grower of man-made hybrids, the problem of the correct name of the species parents will be solved by the International Registration Authority for Orchid Hybrids (IRAOH). If the IRAOH does not accept Clements' name changes, then any hybrid using a given species will be registered under the old name and all old grex names will stand. For example, Clements suggests that the varieties of *Dendrobium speciosum* should be elevated to species rank so that we now have *D. curvicaule, D. pedunculatum, D. speciosum, D. rex*, and *D. tarberi*, while *Dendrobium tetragonum* should be divided into *D. cacatua, D. capitisyork, D. melaleucaphilum* and *D. tetragonum.* However, if the IRAOH does not accept these changes, or if it accepts them as correct but decides to retain the old names for registration purposes, then *D.* Hilda Poxon remains the only correct name for all hybrids made between all varieties of *D. speciosum* and *D. tetragonum* or of any hybrid made between *D. curvicaule* or *D. pedunculatum* or *D. speciosum* or *D. rex* or *D. tarberi* and any one of *D. cacatua* or *D. capitisyork* or *D. melaleucaphilum* or *D. tetragonum.*

For the Australasian Native Orchid Society, and any other orchid society that conducts shows where sections for Australian native orchids are listed on the schedule, there is the added problem of "What is *Dendrobium bigibbum* and where do we put plants which have *Dendrobium phalaenopsis* or *Dendrobium striaenopsis* (syn. *D. schroederianum*) in their parentage?" The IRAOH accepts that *D. phalaenopsis* is synonymous with *D. schroederianum* and that it is not a native of Australia. Clemesha (1978) reduced *D. phalaenopsis* and *D. schroederianum* to synonymy with *D. bigibbum.* Clemesha's treatment was accepted by ANOS, thereby making both species and their intraspecific hybrids acceptable as Australian native orchids as listed in the most recent ANOS Checklist (ANOS 1988). Clements states unequivocally that *D. phalaenopsis* is endemic to Australia, that *D. schroederianum* is a *nomen nudum* and therefore ascribes *D. striaenopsis* to that taxon which occurs on islands in Indonesia and not in Australia, and that *D. bigibbum* and *D. lithocola* (syn. *D. bigibbum* subvar. *compactum*) are different from *D. phalaenopsis* and are Australian native orchids. Which view is acceptable? If the IRAOH view is accepted, then the ANOS Checklist has many errors, but there are few problems in accepting or declining entries into sections for Australian native orchids at shows - any orchid which obviously has *D. phalaenopsis* (syn *D. schroederianum*) in its parentage is not admitted. If Clemesha's view is accepted, then the ANOS Checklist is at odds with the lists published by the IRAOH and with Clements' classification, but there will again be few problems in accepting plants into sections of Australian native orchids at shows - everything having *D. bigibbum, D. phalaenopsis* or *D. schroederianum* in its parentage is acceptable. If Clements' view is accepted, then the IRAOH list has errors, as also does the ANOS checklist, and it will be very difficult to separate plants which have *D. phalaenopsis* parentage from those which have *D. striaenopsis* parentage.

My personal opinion, is that where it concerns man-made hybrids and their parentage, we should follow the IRAOH list, and that the ANOS checklist should mirror that list. Where species and natural hybrids are concerned, we should have the following policy:

(a)Where there has been a mistake made in precedence of naming a species, then the name change suggested by Clements should be used; thus *Dendrobium ruppianum* becomes *Dendrobium jonesii.*

(b)Where there has been an obvious error made in naming a species, then the name change suggested by Clements should be followed; thus the plant well-known as *Dendrobium mortii* becomes *Dendrobium bowmanii* and the plant well-known as *Dendrobium tenuissimum* becomes *Dendrobium mortii* and that no plant should carry the name *Dendrobium tenuissimum.*

(c)That we reserve our opinions on the many elevations to species rank and retain the old varietal, sub-species, or sub-varietal rank of those taxa; thus previously named taxa of *D. speciosum, D. teretifolium, D. canaliculatum,* and *D. bigibbum* would stand until Clements' decisions have been judged to be correct by his peers within the taxonomic field.

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Noel J. Grundon.

Everyone cusses about name changes. One seems to just begin to arrive at a comfortable familiarity with the last lot and some other botanist comes up with a new batch. One has to turn around and force these into the memory, the meanwhile, wrenching out the old ones. Really quite a jolt on the emotions.

Everyone likes to relate to science, to use the correct scientific names for the plants they grow, flower, show, see in the wild or in other collections. Where does this correctness come from; what is it based on? For the answer to these questions one has top go back to fundamentals such as as the original authorship of names and their original descriptions, to the International Code of Botanical Nomenclature, modern 'species' concepts, systematic studies of populations breeding systems and so on. All too often workers fail to carry out a sufficiently rigorous study when describing new species.

A classic example raised in this Catalogue is *Dendrobium mortii.* According to Clements the type specimen attached to this name is of the species previously known to us as *D. tenuissimum* which was described by Rupp. The latter allegedly did sight the *D. mortii* type specimens but not only failed to recognise it as the same species he was about to describe as *D. tenuissimum* but also overlooked the fact that the collection locality of the type was the Hastings River, well south of the range of the species we knew until recently as *D. mortii* (correctly, *D. bowmanii*). It seems an early misinterpretation by Bentham contributed to Rupp's mistake but the unfortunate truth is that subsequent workers followed this and we are stuck with the trauma of re-adjustment.

Stories of this nature or degree of confusion, thankfully, are not common. Nevertheless, Clements has changed names or altered rank of dozens of taxa for a variety of reasons. Most of these can be grouped into several categories:

1. Priority. This relates to the overlooking of pre-existing, validly published names and descriptions of species. Examples are:*Bulbophyllum schillerianum* (syn. *B. aurantiacum* -Clements here demonstrates some sympathy with the 'no-change' attitude in his note "Unfortunately the name *B. schillerianum* pre-dates that of *B. aurantiacum* [a very appropriate name for the species] ....),*B. shepherdii* (syn. *B. crassulifolium*), *Dendrobium fellowsii* (syn. *D. bairdianum*), *D. jonesii* (syn. *D. ruppianum, D. fusiforme,* etc),*D. schoeninum* (syn. *D. beckleri*), *Sarcochilus minutiflos* (syn. *S. tricalliatus*), *Eria kingii* (syn. *E. inornata*), *Oberonia complanata* (syn. *O. muelleriana*), *Trachoma papuana* (syn. *T. subluteum*)and *Oberonia titania* (syn. *O. palmicola*). (In the latter I had difficulty following the explanation, whereas explanations generally, in the Catalogue, are quite clear.)

2. Reinstatement of a taxon previously reduced in status and thus synonymised, eg. *Bulbophyllum sladeanum* (syn. *B. macphersonii* var. *spathulatum*), the genus *Cyrtostylis,* previously treated as part of *Acianthus* (re-instatement is well argued in a separate paper in *Lindleyana*),*Dendrobium baseyanum,* previously synonymised under *D. teretifolium* var. *fasciculatum* (also*D. calamiforme,* another example in this same category), *D. comptonii* (syn. *D. gracilicaule* var. *howeanum*), *Phalaenopsis rosenstromii* (syn. *P amabilis* var. *rosenstromii*), *Sarcochilus borealis* (syn. *S. olivaceus* var. *borealis*), *Taeniophyllum muelleri,* synonymised under *T. glandulosum* by Garay & Sweet, and *Sarcochilus parviflorus* (part of *S. olivaceus*).

3. Re-working of species complexes, raising the status of subspecific taxa (see also comment below on this point) and adding new species, on the basis of systematic studies and revised species concept. Examples include *Dendrobium teretifolium* complex, now also encompassing *D. fairfaxii, D. dolichophyllum, D. calamiforme* and *D. baseyanum; D. tetragonum* complex, to include *D. melaleucaphilum, D. cacatua* and *D. capitisyork;* the much vexed case of *D. speciosum et spp. aff.* belongs here *D. tarberi, D. rex, D. curvicaule* and *D. pedunculatum; D. bigibbum, D. phalaenopsis and D. lithocola* (with *D. striaenopsis*, a re-named, extra-Australian species validated in the Addendum - syn. *D. laratensis*); and the *Dipodium punctatum* group - *D. variegatum, D. pulchellum* and *D. stenochilum.*

I will now turn to those aspects of Clements' work which have led to the name and status changes or the recognition of previously undescribed species.

The most obvious is that of recognising previously ignored prior publication of names and descriptions. The point here is that the author has had the opportunity of examining a great number of type specimens, both here in Australia and overseas, in herberia such as Kew, Edinburgh, Paris etc. That such a course of action is appropriate and necessary for a basic definitive treatment, has been clearly demonstrated by the number of corrections turned up by critical examination of types.

Allied to this is the correctness of interpretation of a type specimen based on careful, critical and informed examination. The cases of *Dendrobium mortii* and *D. bowmanii* well illustrate this point.

The matter of species concept seems to be particularly problematical. A hard and fast definition is not easy to produce, but modern ideas revolve around 'a population of breeding individuals' or groups of such populations between which interbreeding is frequent. The baseline is gene flow and the maintenance of breeding barriers of some sort. In this theory a 'type' (ie. species) can be recognised by possession of a group of characteristics which are maintained by lack of miscigenation with populations of other 'species'. Variation is of course natural within species and populations and means that the designation of a species is often apparently somewhat arbitrary. Many of Clements' new species and re-designations are based on these ideas and he has openly stated that populations which do exhibit a recognisable form and are separated from other, obviously related ones, by a barrier, even simply distance, should be recognised at species level and named accordingly. These are arguably acceptable criteria.

The relegation to synonymy of numerous forms considered by the author to be aberrations of some sort, not representative of a population, is the corollary to the above position. While he does have a wide knowledge of the occurrence of many species in their forms and populations, backed up by other studies in systematics, eg. pollination and mycorrhizal investigations and by extensive literary research, Clements readily admits (pers. comm.) that a great deal more work remains to be done to properly establish the form and population delimitations of many species of Australian orchids.

The great benefit of this work is that it is a comprehensive, systematic treatment of the flora, arrived at by a great deal of 'back to first principles' type of work. It sets up a uniformity of approach which replaces the *ad hoc* conglomeration of before. Given the above and the fact that it includes virtually every name of Australian orchids ever put in print and the citations for these, the Catalogue of Australian Orchidaceae will be the standard reference, and in particular an invaluable research tool, for some time to come.

Dr. Ben Wallace

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In his recently published work, *Catalogue of Australian Orchidaceae*, Mark Clements reviews the taxonomic status of all Australian orchids. Although many taxa remain unaltered, Clements alters the status of 41 taxa and describes 26 new species.These changes fall into two broad categories.

Firstly, there are changes to currently accepted names of certain species which, due to the rules set down in the International Code of Botanical Nomenclature (I.C.B.N.), are considered necessary on the grounds that a prior name exists. In such cases the earliest published names takes precedence, as long as that name was published in a legitimate manner in accordance with the I.C.B.N.., which is itself subject to interpretation and alteration. Species for which name changes are proposed under this rule include:
Dendrobium bairdianum to become *D. fellowsii*
Dendrobium ruppianum to become *D. jonesii*
Dendrobium beckleri to become *D. schoeninum*
Bulbophyllum aurantiacum to become *B. schillerianum*
Bulbophyllum crassulifolium to become *B. shepherdii*
Sarcochilus tricalliatus to become *S. minutiflos.*

Also in this category falls name changes resulting from the rectification of an error in the identification or interpretation of a type specimen subsequent to the original description. This is the case with *Dendrobium mortii/D. tenuissimum/D. bowmanii.*

With regard to the kinds of name changes outlined above, it should be noted that we are totally reliant upon Clements' research and his interpretation insofar as he is the one who has looked at the type specimens in the various herbaria. It is he who has studied the original descriptions and compared living specimens, often from type locations, and it is he who has satisfied himself that these changes are justified.

The second, and more contentious category, involves a number of new determinations which Clements is proposing for certain taxa. These determinations are a reflection of his approach to taxonomy and his interpretation of what should constitute a species. The most obvious feature of this aspect of Clements' work is his almost complete rejection of any taxonomic rank below the level of a species. Only in cases where he considers there is insufficient information about a taxon to allow an alteration of rank to be made does he recognise subspecific rank, such as *Dendrobium discolor* var. *broomfieldii* and *Dendrobium jonesii* subsp. *bancroftianum.* Examples of these new names resulting from this include:
Dendrobium speciosum var. *hillii* to become *D. tarberii*
Dendrobium speciosum var.*curvicaule* to become *D. curvicaule*
Dendrobium tetragonum var. *giganteum* to become *D. capitisyork*
Dendrobium linguiforme var. *nugentii* to become *D. nugentii*
Dendrobium teretifolium var. *fasciculatum* to become *D. calamiforme*
Dendrobium teretifolium var.*aureum* to become *D. dolichophyllum.*

In these cases he considers that these varieties represent taxa which show sufficient morphological or biological variation to warrant elevation to specific rank.

It should be clearly understood by all native orchid enthusiasts that the changes Clements is proposing are just that; they are proposals only. Furthermore, it is the scientific community which will decide upon the validity of Clements' taxonomic determinations and not native orchid hobbyists. It will take some time for Clements' work to filter through to all relevant scientific authorities, for them to assess each proposal on its merits and for their opinions to be made clear. It is they who will accept or reject this work, or aspects of it. Orchid hobbyists should keep this in mind when deciding whether or not to accept all or part of Clements' proposal.

The extent of the effect of the changes Clements is proposing on Australian native orchid hybrids may be unclear for a while, but the problem is not with the plants, but with what names we should write on the labels. The Royal Horticultural Society, through its International Registration Authority for Orchid Hybrids (I.R.A.O.H.) has long solved the problem of taxonomic changes affecting the species from which hybrids are derived by using the principle of 'horticultural equivalent'. This policy allows for the retention of superseded names for orchid species, and permits the registration of new hybrid names using either the 'old' name or the 'new' name for a parent species and accepting that the 'old' name is the 'horticultural equivalent' of the current correct name. This approach would seem simple enough for just a few primary hybrids, but as lines of breeding are extended, and the pedigrees of hybrids become more complex, this system results in a proliferation of synonymous names. It also fails to update names when they are accepted by the scientific community.

It has been the policy of the editorial committee overseeing the preparation of the ANOS "Checklist of Australian Native Orchid Hybrids" to identify and explore synonymous hybrid names where they exist and to amend the listings of hybrid breeding lines accordingly. This undertaking certainly has its problems, especially when taxonomic changes completely invalidate certain species names, but we believe it is in the best interests of Australian Native Orchid hybrids to follow this course. Whenever the taxonomic status of a species is altered, we must check all hybrids in which that taxon is involved and make the necessary amendments. As far as ANOS and the "Checklist of Australian Native Orchid Hybrids" is concerned there is no real problem. The reason for the reduction of the *D. bigibbum* complex to synonymy is discussed on page 3 of the 4th edition. If this position is reversed, as Clements is proposing, the checklist still retains all the information available as to registration details in the table on page 48. It should be noted here that the *D. schroderianum* was reduced to synonymy of *D. phalaenopsis* for registration purposes for the preparation of "One Table List of Orchid Hybrids, Sander's", 1961, thereby backdating synonymous hybrid names.

Here we come to the nub of the problem. Amateur growers and breeders are dependent upon botanists to provide them with correct names for the orchid species they are growing and breeding from. From time to time botanists decide for some reason or other that the names by which we know certain species are incorrect or inadequate and new "correct" names are applied. As far as species orchids are concerned the ramifications of name changes are not great apart from the irritation such changes cause many amateur growers.

However, the confusion this causes to the naming of hybrids is a problem and it would be advisable for growers and breeders to pay close attention to the breeding lines of their plants. It will be important for growers to know which variety of a species (if they choose to retain the old names), has been used in a hybrid, so that if and when Clements' new determinations are accepted, the correct name can be applied. I expect that for sometime to come hybrid names will be registered using, say, *Dendrobium tetragonum*, regardless of what variety of *D. tetragonum* was involved. Clements' splitting of the *D. tetragonum* complex into four species *viz. D. tetragonum, D. melaleucaphilum, D. cacatua* and *D. capitisyork* will result in the registration of new hybrid names citing these new species as parents if the I.R.A.O.H. accepts these proposed changes. Consider *D.* Hilda Poxon (*D. tetragonum x D. speciosum*). If Clements' work is accepted there will be 20 possible names now covered by one name, resulting from 4 species from *D. tetragonum* and 5 species from *D. speciosum.* As good a reason as any to keep careful records of parentage and to now track the parentage of any hybrids you may have that you are unsure of.

For the purposes of judging, the ANOS panel has resolved to accept either the 'old' name or the 'new' name for the time being. It will be acceptable to bench a plant of, for example, *Dendrobium speciosum var. grandiflorum,* under either that name or as *D. rex.* The name changes can be incorporated by benching in sections such as the *Dendrobium speciosum* complex - at least until the situation has stabilised and more information becomes available.

One important fact to emerge from this catalogue is that it is not be possible for taxonomists to finally settle on a correct name for each species. Eventually those species names which are subject to change due to the rules governing precedence of publication may be determined and no further changes of this type will be necessary. However, taxonomists will continue to review and reclassify species and the differences between the splitters and the lumpers will always exist. Clements states that taxa with two or more differences in biology and morphology should be ranked as species, but the real question is that of what defines a species, and just what constitutes a difference and how small such differences need to be before being considered insignificant. At present it would appear that over the next few years we will have to familiarise ourselves with many name changes and new names. However, it may well be that at some time in the future, a new generation of botanists will decide some lumping is in order and some of these names will be reduced to synonymy.

One thing is certain, the taxonomy of Australian orchids (or any other plants or animals) will never be static and that there will always be changes.

Michael Harrison

O

CONFUSED OR POORLY KNOWN AUSTRALIAN ORCHIDS

David L. Jones
Australian National Botanic Gardens,
GPO 1777, Canberra, ACT, 2601.

Introduction

The recent intensive studies undertaken by Mark Clements on the types of Australian orchids, and my own research into a number of complexes using fresh material, have resulted in a number of poorly known or overlooked taxa being once again recognized as distinct. Also a number of old names have come to light which can be applied with certainty for the first time. Many orchid enthusiasts have expressed to me difficulty with keeping abreast of current thinking. For this reason I have decided to put together a series of papers, each of which will deal with a single species which has been confused, poorly known, obscure or simply overlooked. A standard layout will be used for each species and I will include a detailed drawing to facilitate identification. I hope that these papers will stimulate much- needed interest in these orchids since there is still much to learn about them. I would encourage orchid enthusiasts to contribute their knowledge of them via notes in *The Orchadian* so that we can all learn. If anyone wishes to send specimens to me for positive identification I am quite happy to oblige.

Pterostylis pyramidalis Lindley

History: This orchid was described by John Lindley in 1840 from material collected by James Drummond in the Swan River Colony. This locality, commonly used by early botanists and collectors, was a euphemism for just about any place in south-western Western Australia, and, unfortunately, is rarely useful for providing clues about the possible identity of particular species. The type specimens are housed in the Lindley Herbarium at Kew. The identity and status of *Pterostylis pyramidalis* has been confused almost since its conception and it has been generally treated as a synonym of *P. nana* R.Br. (e.g. Bentham, 1873; Erickson, 1965; Rye, 1987). Even after examining the type collection, Alex George maintained *P. pyramidalis* as a synonym of *P. nana* (George 1971). It is interesting to reflect on the possible reasons for the confusion of two such distinct species. Certainly they are superficially similar but the differences were apparent to Lindley who was familiar with both.

In the past, there has been a fairly strong tendency to match western material with known species from the eastern states and I believe thisto be a contributing factor in this case. There has also been a tendency to regard *P. nana* as a widespread and extremely variable species. That *P. nana* is variable is beyond question; however that variability is limited and the species can be defined. These limits do not extend to *P. pyramidalis* and the two can be differentiated by the features outlined in the section *Confusing Species.*

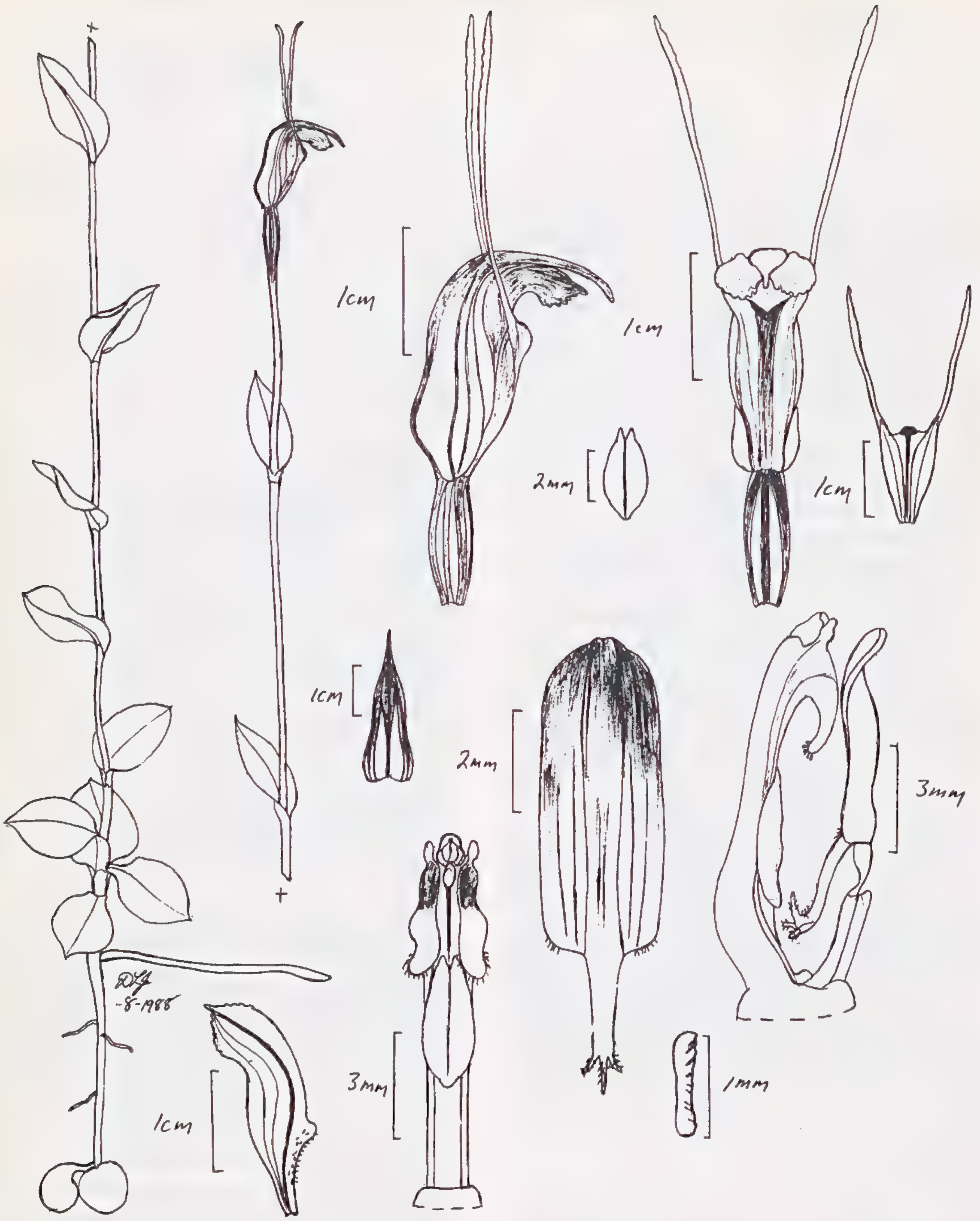
During field work in south-western Western Australia in 1985 and 1986, I collected excellent material of *P. pyramidalis* and at the time thought it was an undescribed species. A search of the literature revealed strong affinities with Lindley's taxon and suggested that a re-examination of the type of this species was needed. Using material collected by the author, Mark Clements made a careful comparison with the type in 1986 and concluded that *P. pyramidalis* was a distinct taxon (Clements pers. comm.). For convenience a sketch of the habit of the species was included in my book (Jones, 1988).

Distribution: *P. pyramidalis* is confined to south-western Western Australia. It is known from a few localities around Bunbury, Mandurah and Northcliffe.

Habitat: This orchid grows in low-lying areas among small shrubs in black, peaty soil. These soils usually become inundated during the winter and in very wet years the base of the plants may be immersed in shallow water. The vegetation is usually *Banksia* woodland with scattered eucalpyts. The orchids commonly grow in the protection of low shrubs or among grasses and sedges.

Flowering Period: July to September.

Biology: The flowers lack any apparent perfume but are insect pollinated. From pollination to seed-shedding takes 8-10 weeks. Reproduction is by seed and daughter tuberoids. This species usually grows in large, fairly dense colonies and may be locally common. Juvenile plants consist of a short, erect stem with the leaves arranged spirally, not in a basal rosette.



Pterostylis pyramidalis, Bonbury, WA. (DLJ 2057). (a) plant (b) flower from side (c) flower form front (d) column and labellum from side (e) column from front (f) labellum flattened out, from above (g) stigma (h) dorsal sepal, flattened out (i) pollinium (j) petal (k) lateral sepals flattened out.

Confusing Species: *P. pyramidalis* is related to *P. nana* but the two are not easily confused once comparisons are made. *P. pyramidalis* can be distinguished from that species by vegetative features and floral morphology. It grows much taller than *P. nana*, in fact it is the tallest species in the *P. nana* group and specimens about 30 cm tall are not uncommon. Plants lack a basal rosette and have numerous, ovate-cordate leaves arranged spirally up the stem. Those towards the base are shortly petiolate whereas the middle and upper leaves are sessile. By contrast, *P. nana* has a distinct basal rosette of petiolate leaves and a couple of sessile stem leaves. The flowers of *P. pyramidalis* are much larger in all parts, the petals being much more broadly dilated and the labellum broader and longer. Also the two species grow in very different habitats.

Another undescribed taxon from south-western Western Australia is similar to *P. pyramidalis* but has crinkled to crisped margins on the stem leaves and reddish-green petals. It grows in jarrah or karri forest in well-drained soils.

Conservation Status: *P. pyramidalis* is conserved in the Yalgorup National Park. Suggested conservation status according to Leigh, Briggs and Hartley (1981), is 3RC.

Notes: A suite of undescribed taxa are presently included under *P. nana*. Many of these will be described shortly. *P. pyramidalis* is a very distinctive species within the group. It is noteworthy that it maintains its distinctive features in cultivation. It is also not fire stimulated as on a few occasions now I have observed plants on recently burnt ground and they are comparable in vigour, height and all morphological respects with those on unburnt areas.

Acknowledgements

I thank Ron Heberle and Wayne Merritt for supplying fresh material for my studies and Barbara Jones for processing the manuscript. Mark Clements helped with discussions and historical information and Gillian Savage commented on the manuscript.

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COMMING TO THE CONFERENCE?

The First ANOS Conference is drawing closer. If you have not yet registered and you intend to do so please send in your registration now. (Remember, the price increases after 1st July). All members were sent a program and registration form with their March issue of *The Orchadian*. If you need another contact Ron Wheeldon, 227 Mt Keira Road, Mt Keira, 2500, (042) 28 7851.

This conference is to be a major event for native orchids and anyone with any interest in them will find the program of speakers interesting as there is something to interest everyone with a large range of topics to be covered.

This is also a great opportunity to socialise and get to know growers from other parts of Australia, New Zealand and International visitors.

A major show is to be held in conjunction with the Conference and will be run from 27 - 30 th September. The schedule will be available soon and anyone wanting one should send SAE to the above address. The prize money is quite substantial and should make entering rewarding. If you are unable to attend the Conference it will be well worth visiting the show. Please tell anyone who may be interested that it is on so that they may get to see the display.

There will also be a large plant sales area with commercial stands and an ANOS stand. Many bargains should be found here. Anyone wishing to sell plants at the ANOS stand should make sure they have the appropriate form which will be available soon.

For those who prefer not to grow orchids, but to just admire them there will be a photographic competition and an art show with paintings, china paintings and other art featuring native orchids. Many of these items will be for sale.

Mark the dates 26 - 30 September in your diary now.

ANOS AUTUMN SHOW REPORT.

On Sunday 29th April, 1990 ANOS Central Coast Group in conjunction with Ken Russell hosted the ANOS Autumn Show at the Brentwood Retirement Village, Kincumber. There were 146 plants benched in 18 classes.

Due to the time of year many plants benched were warm growing and there was the expected large display of *Dendrobium bigibbum* and allies. Among these were some very attractive dark forms, with some lighter tones as well.

The terrestrials were well represented by a number of *Pterostylis* species and hybrids which added interest for the non-orchid growing visitors. There was also a good selection of cooler growing epiphytic hybrids, with *Dendrobium tetragonum* in their parentage. Two plants owned by Ken Russell, *Dendrobium* Aussie Treat (*D.* Ellen x *D.* Peter) and the very attractive *D. bigibbum* x *D.* Ellen were good examples of this type of hybrid.

The Australasian species and hybrids were also well represented with several *Dendrobium* sect. *Latouria* hybrids benched by Phil Spence as well as a very attractive *Dendrobium forbesii.*

Darryl Smedley won the Other Terrestrial Class with a plant of the rarely seen and hard to grow species, *Paphiopedilum violascens* .

The world of hybrids was indeed to the fore with the Grand Champion of the show being *Dendrobium* David Baver 'Monroe', owned by Laurie Jarvis. This plant was also granted an HCC/ANOS at this Show (more details in the next issue) so Laurie was a very proud owner.

Allan Peck's plant of *Dendrobium* Debbie McFarlane was Champion *Dendrobium* -Not Exclusively Australian Mainland Parentage.

The Badge Club was represented by Barry Collins who provided a most interesting display of badges covering societies from Australia and overseas. There was a marked interest in purchasing native orchid badges and a generally successful day as people became aware of this form of orchid involvement.

Pat Burns

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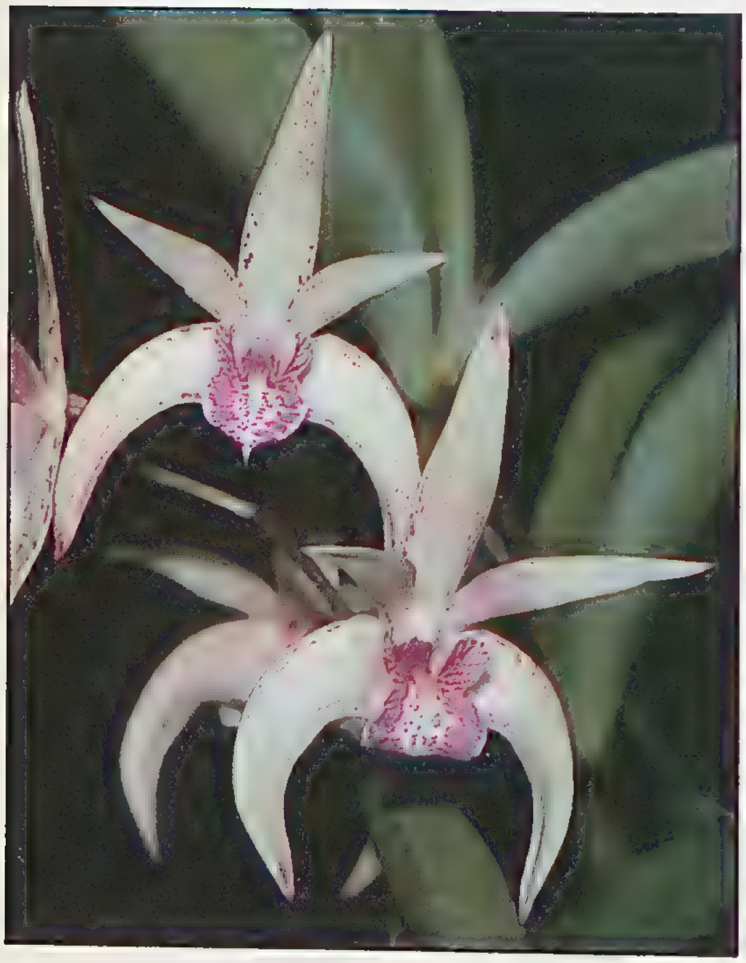
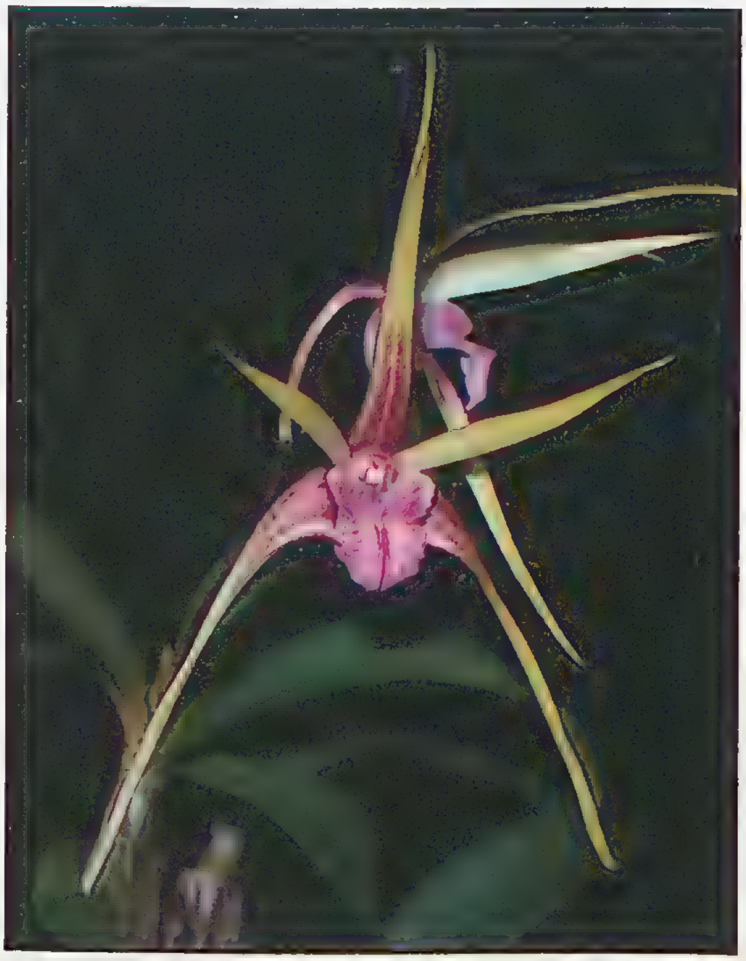
Photos by Mark Webb

***Dendrobium* Aussie Treat**



***Dendrobium* Lorikeet**



Dendrobium Lowana Nioka

Dendrobium bigibbum x *D.* Ellen

Dendrobium Rosy Curls

Paphiopedilum violascens

CONSERVATION

Rare Orchid Species Threatened by Mining.

The Western Mining Corporation has applied to the Victorian Government to carry out exploratory drilling within the Deep Lead Flora and Fauna Reserve, near Stawell. This will threaten rare orchid species.

An Advisory Group was set up to evaluate the application and recommended that no mining be carried out in the reserve and that the surrounding Hardwood Production and Education areas be added to the Reserve. The Government has been reluctant to endorse this finding. A review of the Mines Act has been completed and the implications are discussed in the ANOS Victorian Group Bulletin - April 1990. It should be noted that mining in this Reserve would set a dangerous precedence.

Four orchid species, *Caladenia audasii, Diuris palustris, Prasophyllum lindleyanum* and *Thelymitra mackibbonii* could face extinction if mining goes ahead. The *C. audasii* and *D. palustris* populations in the reserve are the largest in Victoria and *Thelymitra mackibbonii* is not found anywhere else.

The reserve contains at least 32 orchid species plus several undescribed or hybrid *Caladenia* and during the springtime is a virtual carpet of colour, starting with many *Diuris lanceolata,* quickly followed by *Caladenia carnea* and *C. caerulea* then masses of *Glossodia major.* Showing through these are *Caladenia* species such as *C. diiltata, C. magnifica, C. patersonii* and *C. reticula* as well as many *Thelymitra* species including *T. antennifera, T. carnea, T. chasmogama, T. flexuosa, T. luteocilium, T. macmillanii, T. nuda T. pauciflora* and *T. rubra.*

The squirrel glider, one of Australia's most endangered species, would also be threatened by mining. The glider was one of the reasons the area had been declared a reserve in 1988.

The support of all orchid lovers is requested to stop the desecration of the Deep Lead Flora and Fauna Reserve. Your letter of protest to the Minister,C/- Parliament House, Melbourne. would be appreciated.

Everett Foster, Belmont. Vic.

NEW ANOS GROUP.

On Thursday, February 8th 1990, the ANOS Mackay & District group was formed after a public meeting of interested persons.

The group will hold its meetings on the 2nd Thursday of each month at the Andergrove Neighbourhood Centre, Bedford Road, with meetings commencing at 8pm.

We have at present only a small membership of some 20 members, but hope to improve this as time goes by.

Office Bearers were elected as follows:

President:	Mr Harry Verroen.
Vice President:	Mr Lew Dovey.
Secretary/Treasurer:	Mrs Lyn Verroen.
Committee Members:	Mr Ken Crouther. Mr John Newman.

Mrs Lyn Verroen
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ANOS Badges

The second Conservation Badge, featuring *Dendrobium bigibbum*, is available for $4.50 plus $1.00 postage & packaging. All profits from the sale of this badge will be used for orchid conservation.

Also available is the badge for the 1st Australasian Orchid Conference. This badge features *Pterostylis gibbosa* which has been chosen as the logo for this conference. $5.00 plus $1.00 postage and packaging.

Both badges are available from,
ANOS,
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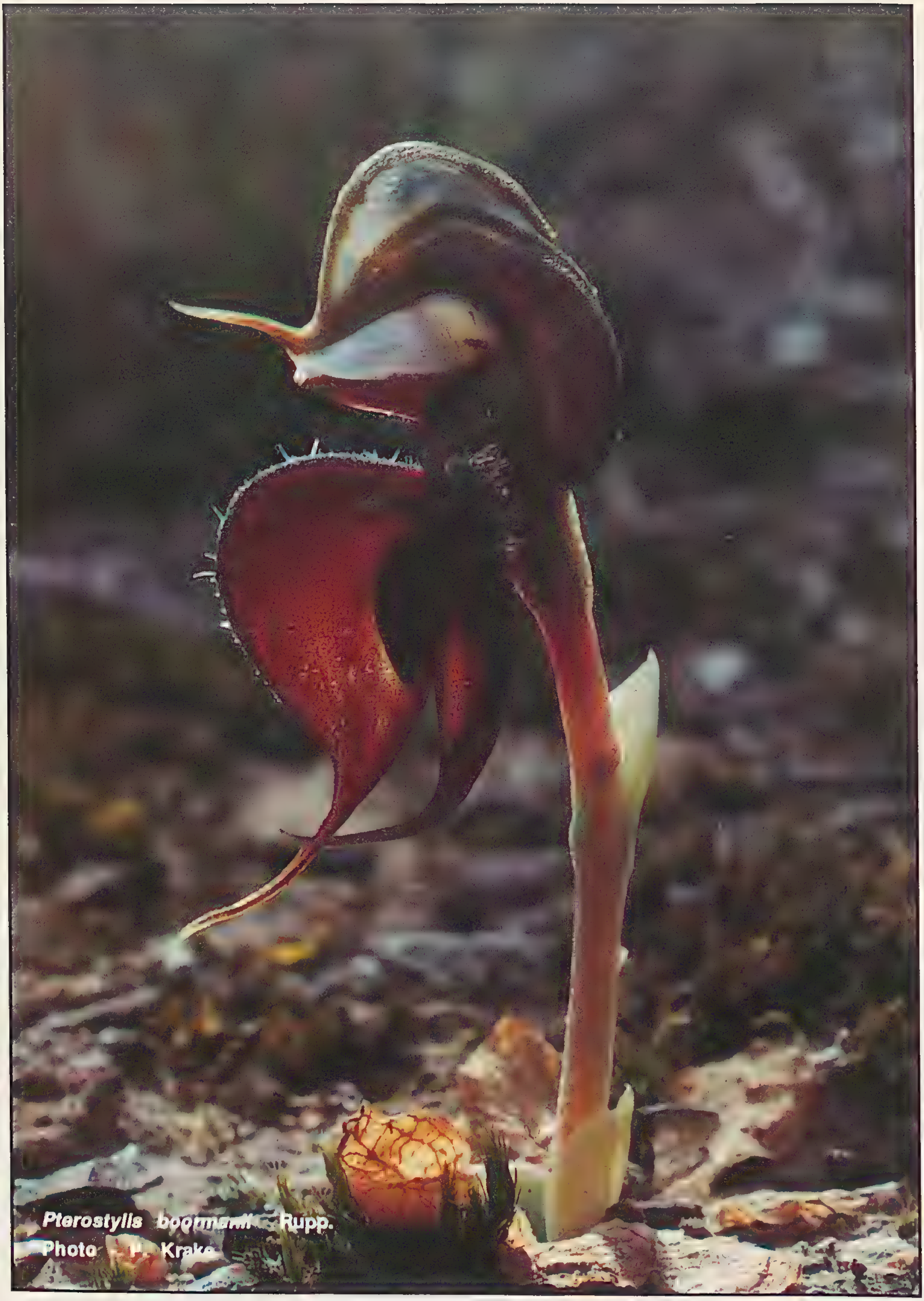
Clarence St.
Sydney, 2000.



Pterostylis boormanii Rupp.
Photo P. Krake

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